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FIRST SESSION OF THE FORTY-FOURTH CONGRESS.

EXECUTIVE DOCUMENTS

PRINTED BY ORDER OF THE

HOUSE OF REPRESENTATIVES.

1875-'76.

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TO

THE EXECUTIVE DOCUMENTS

OF THE

HOUSE OF REPRESENTATIVES OF THE UNITED STATES

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44TH CONGRESS, 1st Session. } HOUSE OF REPRESENTATIVES. { Ex. Doc. 1, Part 3.

REPORT

OF THE

SECRETARY OF THE NAVY;

BEING PART OF

THE MESSAGE AND DOCUMENTS

COMMUNICATED TO THE

TWO HOUSES OF CONGRESS

AT THE

BEGINNING OF THE FIRST SESSION OF THE FORTY-FOURTH CONGRESS.

WASHINGTON:
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1875.

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REPORT

OF

THE SECRETARY OF THE NAVY.

NAVY DEPARTMENT,
Washington, D. C., November 29, 1875.

SIR: The following report of the Navy Department and naval service for the present year is respectfully submitted:

VESSELS OF THE NAVY.

The number of vessels of every class and description now borne on the Navy Register is 147. These carry, all told 1,195 guns, and are of 152,492 tons measurement. Of these, 26, carrying nominally 266 guns, are sailing-vessels without steam-power, of which number four, namely, the Santee, the Dale, the Saratoga, and the Portsmouth, are in use as training and practice ships; two, the Saint Marys and the Jamestown, are assigned to States as school-ships, under the act of Congress providing therefor; three, the Pawnee, the Saint Louis, and the Saint Lawrence, in use as hospital-ships or as quarters; six, the Antietam, the Ohio, the Vermont, the Supply, the Onward, and the Guard as coal, store, and supply ships at the various stations and for the several squadrons; six, namely, the Independence, the New Hampshire, the Relief, the Sabine, the Potomac, and the Savannah in commission as receiving-ships; two, the Macedonian, and the Cyane laid up in ordinary as useless for any present purpose, and one, the old New Orleans, remaining, as has been the case for the last half century, on the stocks at Sackett's Harbor. The Constellation is useful as a practice-ship. These ships, though most of them are useful for the purpose to which they are assigned and to some extent a necessary part of the naval service, are in fact mere representatives of the Navy of the past, still remaining on the Register to be utilized as best may be, but of little or no value as part of an efficient force for either the cruising or fighting purposes of the present day.

The steam-vessels of the Navy, as distinguished from iron-clads and torpedo-ships, number in the whole ninety-five, of which, however, twenty-five are tugs, employed as towing, ferry, or torpedo boats at the various navy-yards or stations, or in use as surveying-vessels, or in the service of the Fish-Commission, in accordance with the law directing the same. Twenty-nine of all classes are in ordinary at the yards on the Atlantic or at Mare Island; three, namely, the Gettysburg, the De-

spatch, and the Tallapoosa, are used as freight and dispatch vessels; three more are in commission as training and receiving ships, at all times ready for service, and the remainder are in commission on the several stations or are at the various navy-yards ready for use when required.

Of these wooden ships, 18 are in fact new, the Trenton, Adams, Essex, Enterprise, Alliance, Alert, Huron, and Ranger, being the 8 new sloops built under special appropriation, and 10 others, the Monongahela, Tennessee, Mohican, Swatara, Vandalia, Marion, Quinnebaug, Galena, Nipsic, and Tallapoosa being rebuilt with live oak timber and supplied with substantially new machinery during the two or three years last past. Besides such of these new ships as are in commission, 32 others, including the largest and most efficient ships of the Navy, are in actual service as cruisers or training-ships, and 12 of the remainder, though requiring more or less repairs to their boilers and machinery, could, if needed, be put into condition for service as soon as sailors could be enlisted to man them.

IRON-CLADS.—Our iron-clad fleet consists of 26 vessels, classed as follows: 3, the Massachusetts, Oregon, and Colossus, which are of a class and in condition to be of no service whatever, having been designed during the war as large sea-going iron-clads, but never launched, and though their names still appear on the Navy List, they consist only of their wooden frames, with a single exception, much deteriorated by time, and their unfinished armor and machinery stored in the navy-yards. The remaining 23, consisting of 21 vessels of the monitor type, and 2 iron torpedo-ships, are all efficient vessels of their class, and very powerful in both defensive and offensive operations near our shores. Five of them, namely, the double-turreted monitors Amphitrite, Monadnock, Miantonomah, Puritan, and Terror, are in process of complete repair, requiring from four to six months to finish if pushed, while the remaining 18, consisting of the Roanoke, the 2 torpedo-ships, Alarm and Intrepid, and 15 single-turreted monitors, namely, the Ajax, Canonicus, Camanche, Catskill, Dictator, Jason, Lehigh, Mahopac, Manhattan, Montauk, Nahant, Nantucket, Passaic, Saugus, and Wyandotte, are all in good condition, ready for any service at any time. This makes 80 available ships, including 16 iron-clads and 2 torpedo-boats.

CRUISING STATIONS.

Our cruising stations remain the same as last reported in number and designation, being six separate stations, each commanded by a rear-admiral, and designated respectively the European, the Asiatic, the South Pacific, the North Pacific, the South Atlantic, and the North Atlantic stations. These comprise within their limits the whole field of naval operations in every part of the world.

The European station.—There has been, as yet, no change in the force on this station during the past year, which is composed of the Franklin, flag-

ship, Congress, Alaska, and Juniata. Rear-Admiral John L. Worden, who is at present in command, left Norfolk January 14, in the Powhatan, which was assigned to this special duty, and to bring home Rear-Admiral A. L. Case, relieved on his retirement, and others who had served their full term on the station. The Powhatan arrived at Lisbon January 29, and on February 3 following, the transfer of commands took place at that port. February 8 she left Lisbon for home, touched at Madeira, and reached New York March 18. The several vessels of the station which had been assembled at Lisbon proceeded to the Mediterranean, and, separating soon after, visited the principal commercial ports from the straits to the eastern coast.

Leaving the Congress in the Mediterranean, Rear-Admiral Worden proceeded, in May, in the Franklin, taking with him the Alaska and Juniata, to the German coast. The last-named vessel, delayed on account of an accident to her machinery, did not go farther than Hamburg. The Franklin and Alaska entered the Elbe, visited Glückstadt, and proceeded thence to Kiel, Stockholm, and Cronstadt, arriving at the last-mentioned port July 13. They remained until July 20, and returned, via Copenhagen, to Southampton, when the three vessels again met. The reception of the officers and men of these ships, at the several ports mentioned, was of the most gratifying character, and the interchange of civilities was calculated to strengthen the already strong ties of friendship existing between the respective countries. The vessels proceeded southward from Southampton August 30, the Alaska via Havre, and entered Lisbon early in September.

The Congress had in the meantime visited various ports from Gibraltar to Alexandria, but, in consequence of the rigid quarantine maintained in the ports of Syria, contemplated cruises marked out for that coast could not be made.

Since their return to the Mediterranean continued activity has marked the movements of the vessels of the station.

Only one circumstance has arsien within the limits of the command to mar the pleasant and usually existing intercourse. It became necessary in August last to order two vessels to Tripoli to inquire into insults offered to the consul of the United States by sailors of the Tripolitan squadron.

The Hartford, then just out of the canal, (on the way home from the Asiatic station,) was telegraphed to touch at Tripoli, and Rear-Admiral Worden received orders to send one or more vessels of his command, if necessary, to that point for the purpose stated, and he accordingly dispatched the Congress. Both vessels arrived about the same time, the 17th of August, and the senior in command entered upon the duty to which he was assigned. They were not well received by irresponsible parties on shore, who made some rude demonstrations; but the matters were soon satisfactorily settled, suitable atonement being made by the Tripolitan government, and the two vessels took their departure on the

28th of August, after a full restoration of the previously existing friendly relations.

The Asiatic station.—The force on this station, probably the most important of any of our foreign stations, consists of the Tennessee, (flag-ship,) Kearsarge, Yantic, Ashuelot, Monocacy, Saco, and Palos, and is under the command of Rear-Admiral William Reynolds. Rear-Admiral Alex. M. Pennock, whom he succeeded, relinquished the command at Yokohama, June 24, on account of ill-health, and returned home by mail-steamer to San Francisco. Commander R. F. R. Lewis, the senior officer on the station, was left in command until the arrival out of Rear-Admiral Reynolds. The latter sailed in the Tennessee from New York, June 26, and proceeded to his station by way of the Mediterranean and the Suez Canal. The Tennessee touched at Gibraltar and Palermo, passed safely through the canal, thence on to Aden, Bombay, Colombo, and Penang, at which latter place Rear Admiral Reynolds reported his arrival on the 26th of September. He has probably reached Yokohama, the headquarters of the station.

The Hartford, which had been a full term on the station as flag-ship, returned home by the same route—the Suez Canal and the Mediterranean—and arrived at New York, October 19, and was put temporarily out of commission.

The Lackawanna, also, has returned home, having arrived at San Francisco April 27.

The vessels composing the force on this station have performed the usual routine of cruising, although some of them, having been long in commission, have, of necessity, undergone considerable repair. The commercial ports in Japan and China, open to our vessels, have been frequently visited, and the cruising has also been extended to Sumatra, Batavia, Borneo, Manila, Singapore, and other settlements in the straits. Neither our citizens, nor their property or interests, over this vast field of commerce and resort, have been so interfered with as to appeal for naval protection, and the most cordial relations have continued to prevail between our officers and the authorities of all the eastern powers.

The South Pacific station.—The vessels now on this station are the same as at the date of the last annual report: the Richmond, (flag-ship,) Omaha, and Onward; the last named of which is used for a stationary store-ship at Callao.

Rear-Admiral Napoleon Collins, who was in command of the force one year ago, died at Callao on the 10th of August last. Funeral honors of the highest order, due to his prominent rank and long and faithful service, were shown to his memory by the officers of his command, and the officers, authorities, and citizens of other nations, to whom he was known and with whom he had been associated on the station. By his death, Captain Edward Simpson, senior officer on the station, became temporarily the commander of the station, and continued so until the arrival of a successor to Rear-Admiral Collins, Rear-Admiral

Reed Werden, who reached Panama September 25, and hoisted his flag on the Richmond.

During the political disturbances on the Isthmus of Panama, in August and September, on account of which some apprehension was felt lest lawless parties might interrupt the transit over the railroad, molest our citizens, or injure their property, two cruisers of this station were ordered to remain in the bay of Panama, prepared to render assistance, so long as their presence should be necessary. Quiet was restored without any interference on the part of our force, and Rear-Admiral Werden sailed from Panama, in the Richmond, October 25, for the southern part of the station, leaving the Omaha still in port.

The small number of cruisers available for service on this station, rendering it inexpedient for either of the two vessels now there to extend their movements to the islands of the South Pacific and to Australia, they are necessarily confined to the west coast of South America, from Panama to the ports of Chili.

The North Pacific station.—The force on this station is commanded by Rear-Admiral John J. Almy, and consists at present of the flag-ship Pensacola and the Tuscarora. The Benicia, Portsmouth, and Narragansett have been put out of commission during the past year, the last mentioned having completed, during the year, a series of useful surveys in the route of the steamers along the California and Mexican coasts.

The Saranac, one of the most useful vessels on the station, was lost in Seymour Narrows, on the 18th of June last, while on the passage to Sitka, the fur-seal islands, and Behring Straits. In connection with the unfortunate loss of this vessel, it is a pleasure to recur to the courteous and valuable service of the officers of Her Britannic Majesty's government on that station. In passing through the narrows, the Saranac was caught in a whirlpool, thrown violently on a sunken rock, and so badly injured as to sink in deep water soon after reaching the neighboring shore. Her officers and crew were safely landed, but a scanty supply of provisions and clothing only was saved. A cutter was sent to Victoria for assistance, but in the meantime, information of the disaster having incidentally reached Rear-Admiral A. A. Cochran, C. B., the commander of Her Britannic Majesty's naval force on that station, he, with great promptness and forethought, dispatched one of his squadron, the Myrmidon, Commander Richard Hare, under a full head of steam, to the assistance of the officers and crew of the Saranac. The Myrmidon reached Seymour Narrows in advance of the steamer which had been engaged at Victoria. Every possible assistance was extended to the shipwrecked people, and their wants, such as provisions, blankets, clothing, &c., immediately supplied. Part of them were transferred to the Myrmidon, and the others to the Hudson Bay Company's steamer Otter, and conveyed to Victoria. Rear-Admiral Cochran himself, in the evening of the same day on which he sent the Myrmidon, left Victoria in his flag-ship, the Repulse, for Sey-

mour Narrows, fully provided with divers, lighters, and other appliances for either raising the Saranac or recovering her guns and other articles. The impossibility, in the opinion of the officers of the Saranac, who were met on the way, of rendering any service of this nature, alone prevented Rear-Admiral Cochran from making an effort to carry out the purpose so generously conceived. His excellency James W. Teatch, lieutenant-governor of the province, and Mr. J. H. Innis, Her Britannic Majesty's store-keeper at Victoria, as did the officers of Her Britannic Majesty's two vessels named, extended cheerful aid to the officers and crew of the Saranac while waiting transportation to San Francisco. The Department duly acknowledged and expressed its appreciation of these kind acts of Her Britannic Majesty's officers, but desires to thus publicly recognize the same.

The Benicia having been placed at the disposal of His Majesty the King of the Hawaiian Islands, who desired to visit the United States, received him and his suite on board, at Honolulu, in November, 1874, with appropriate honors, and safely landed them at San Francisco about the 1st of December. On the conclusion of his visit, His Majesty was offered a passage back to his dominions in the Pensacola, the flag-ship of the station. He embarked at San Francisco February 2, and disembarked at Honolulu on the 15th of the same month. Such means as were at the command of the Navy Department were not spared to provide for the comfort of His Majesty and suite, both on shipboard and during their stay in the country; and the relations between them and the officers of our naval service were of a most agreeable and gratifying nature. He subsequently availed himself of a passage in the Pensacola, which contemplated a cruise among the islands of the Hawaiian group, to visit some of the more important ports of his dominions.

The Tuscarora, which has been engaged in deep-sea soundings, while performing other legitimate duties, after completing a line from San Francisco to Honolulu, left the latter port on the 4th of March for the Samoan group, for the purpose of conducting, at the instance of the Department of State, an inquiry into the claims, or complaints, of American citizens against the natives of that group. This duty was performed in a highly satisfactory and prudent manner, and the course of her commanding officer and those associated with him was such as to inspire a feeling of friendship and good-will between the rulers of Samoa and the citizens of the United States. Mr. Steinberger, special United States commissioner, availed himself of a passage on the Tuscarora to Samoa on this occasion. Returning from this service, the Tuscarora refitted and sailed again from San Francisco, on the 31st October, for Honolulu, and will run a line of deep-sea soundings from that point to Australia. This is an important cruise, and she will be absent some months.

The Saranac, in the early part of the year, returned from a visit to La Paz and other places in the Gulf of California, whither she was sent

in consequence of disturbances affecting the lives, property, and interests of American citizens. All proper steps, under the circumstances, were taken by her commanding officer, looking to the protection and encouragement of our people engaged in mining and other lawful pursuits in that quarter. Her loss, as hereinbefore stated, interrupted a cruise which promised to be both useful and interesting, commercially and scientifically.

Rear-Admiral Almy has given much of his time to the Hawaiian group, probably the most important and interesting quarter of his command. He sailed from there on the 25th of September last for Lower California and the west coast of Mexico, and is looked for at San Francisco about February.

The South Atlantic Station.—The force on this station is commanded by Rear-Admiral William E. Le Roy, and consists of the Brooklyn, (flag-ship,) Monongahela, Wasp, and Frolic. The Brooklyn joined the station May 20, taking the place of the Lancaster, and the Frolic has probably reached it. The latter is to succeed the Wasp, which is about worn out, and not being in a condition to make the passage home, has been ordered to be sold out there.

The Lancaster, with the exception of the few months when she was recalled for service on the North Atlantic station, had been on the coast of Brazil since 1869, in constant use, and having been ordered home sailed from Rio de Janeiro April 22, with every prospect of a fair and happy voyage—the Monongahela taking her place temporarily as flag-ship until the arrival out of the Brooklyn. A few days after her departure from Rio de Janeiro yellow fever of a violent and fatal type appeared on board, and the ship was not freed of its presence until the senior medical officer, the assistant surgeon, and one of the lieutenants, all officers of high character and promise, had fallen victims to it. In this emergency, with but one other medical officer left upon whom to rely for professional aid, a long distance from home and upward of four hundred souls on board, the commanding officer of the Lancaster very wisely concluded to run into the Brazilian port of Bahia, some four hundred miles to the westward. On her arrival, Baron Ivanheimer, commodore commanding the Brazilian squadron, was in port, and immediately on learning of the serious loss sustained by the Lancaster came forward with every offer of assistance. The hospital was opened, and he also tendered the services of one of the surgeons of his flag-ship, Dr. E. A. F. Da Rocha, to accompany the Lancaster home. The services were gratefully accepted, and the Lancaster, after obtaining necessary supplies, pursued her voyage. Fortunately no other cases of fever appeared, and the ship reached Norfolk June 25, and was ordered to Portsmouth, N. H., and put out of commission. The self-sacrificing spirit of Dr. Da Rocha in accepting a duty, which, in the event of a re-appearance of the fever, promised to be both arduous and dangerous, was not less worthy of admiration than the generous act of Baron Ivan-

heimer in tendering the services of a competent surgeon of his own command to accompany the Lancaster to the United States. Dr. Da Rocha was attentively cared for during his necessary detention in this country and provided with a passage back to his own.

The Monongahela, which was sent to Kerguelen Island to receive the transit of Venus observers stationed there, was successful in her mission, and returned to Rio de Janeiro April 19, after four months' absence.

Advices have been received from Rear-Admiral Le Roy, under date of October 13, at which time he was at Montevideo. He contemplated a visit to the southwest coast of Africa, leaving early in December.

Careful sanitary measures have been necessary on this station during the past year to keep the vessels clear of fever. Some other deaths from this cause, than those herein mentioned, have occurred, but great improvement has recently been reported in the health of the station.

The North Atlantic station.—This station is commanded by Rear-Admiral J. R. M. Mullany. Of the vessels which composed the force on this station one year ago, the Canandaigua, Kansas, and Wachusett have been withdrawn and put out of commission; the Brooklyn has been transferred to the South Atlantic station, and the Colorado sent to New York as a receiving-ship. The Plymouth, the Hartford, the Swatara, the Alert, the Huron, the Powhatan, the Rio Bravo, and the Despatch have been added to it in the meantime, so that it now consists of the Hartford, Worcester, Powhatan, Plymouth, Swatara, Ossipee, Alert, Huron, Shawmut, Rio Bravo, Despatch, Dictator, Canonicus, tug Pinta, and store-ship Pawnee.

Early in the year the vessels were stationed chiefly at New Orleans and Key West, but were soon after distributed to other parts of the command. The Canandaigua was ordered to Aspinwall, and thence to the Atrato and Napipi, in connection with the examination of the isthmus, which was made by Lieutenant Frederick Collins and party. On the completion of this duty she returned to New Orleans; thence to Port Royal and Norfolk, at which latter port she was laid up.

Rear-Admiral, Mullany, himself left New Orleans March 22, in the Worcester, and meeting the Colorado at Havana, transferred his flag to the latter vessel, which continued as the flag-ship until her departure from Port Royal, May 13, for Hampton Roads and New York, when he retransferred his flag to the Worcester. As early as April it was found that the appearance of yellow fever at Key West rendered it unsafe to keep the vessels at that place; accordingly the Plymouth, Ossipee, and Shawmut, on the 6th of April, were dispatched in various directions, and the Colorado, Worcester, Dictator, Pawnee, and Pinta were ordered to Port Royal, where the three last mentioned have since remained.

The Ossipee visited Vera Cruz, Tampico, Galveston, and returned to Port Royal. Subsequently she visited Aspinwall, where she remained some weeks, and returned to Port Royal again in July, was then ordered to Norfolk for slight repairs and to give her crew liberty, and

on the 27th of October sailed on a cruise through the Windward Islands, from which she has since returned to Port Royal. The Plymouth visited Matanzas, Cape Haytien, Samana, San Juan, (Porto Rico,) Saint Thomas, and Santa Cruz; returned to Port Royal; was then dispatched to the Rio Grande, where her launches and boats were engaged on picket-duty; returned, via Port Royal, to Norfolk, where she now is. The Shawmut made some examinations near Walling's Island, and afterward made a cruise to Port au Prince, Jamaica, Honduras, Bay Islands, and Havana, and on the 16th of August sailed from Norfolk for Aspinwall, at which latter port she was when last heard from.

In consequence of political troubles in Panama, Rear-Admiral Mullany was in August ordered to proceed to Aspinwall in the Worcester, for the purpose of protecting our citizens and keeping open the transit on the isthmus, should either be endangered. He arrived there August 14. The vessels of the South Pacific station, the Richmond and Omaha, at Panama, were temporarily placed subject to his orders, so far as they were needed, for the protection of the transit and our citizens. No occasion arose for the use of the means at his command; every indication was shown of a desire on the part of those in authority to observe treaty-stipulations and to respect the rights guaranteed our citizens; and, with the assurance that these should continue to be observed, he departed from Aspinwall October 24, touched at Kingston, Havana, and Key West, and arrived in Hampton Roads November 12

The vessels of the station have cruised with diligence, and it has been necessary that they should come to Norfolk to give their crews liberty, which some had not had for many months.

This station comprises within its limits all the West Indian and adjacent islands, the waters of the Caribbean Sea and the Gulf of Mexico, and those that wash the shores of the great isthmus, Central America, and the Spanish main. Here it is that most of our home and coasting trade touches foreign waters and comes in contact with foreign authority. Here are centered the most delicate interests of our commerce, and here arise the most difficult responsibilities which rest upon us in our relations to other governments. The fleet which occupies this station is sometimes called the home squadron. It now consists, for general purposes, of the ships above mentioned, but all our iron-clads, except two which are attached to the Pacific fleet, really belong to it when in commission. All our vessels on detached service in the Atlantic can also be readily attached to this fleet, as well as our reserved force of receiving and training ships, kept in condition for service at the various Atlantic stations. It could also be rapidly re-inforced at any time by all the ships in ordinary at the several Atlantic navy-yards which are fit for service. The ships of the European and South Atlantic stations are also within call, and could reach our shores in less than a month, should their presence be needed. By utilizing all these means, we should be able, if required, to bring into actual service on our own

shores, in a very short time, a fleet of at least 40 cruisers, carrying over 500 guns, besides 15 iron-clads and 2 iron torpedo-ships. Considerably more than one-half of this force is already in commission, and the remainder might be put into service as rapidly as their crews could be enlisted and organized.

THE TRANSIT OF VENUS.

In my report of last year I gave an account of the organization of the expeditions for observing the transit of Venus in December last, of the preliminary practice at the Naval Observatory, and of the final departure of the expeditions to their destinations.

The northern stations were Wladiwostok, in Siberia; Peking, in China, and Nagasaki, in Japan; the southern stations were Kerguelen Island, Hobart Town, Queenstown, New Zealand, and Chatham Island

At no one of these stations did the observers fail entirely, though the degree of success was various at different places, the weather of course being the cause of this variation. It is gratifying to be able to say as much as this. Some parties belonging to other nations failed in consequence of bad weather.

The gentlemen composing the three northern parties returned to the United States by the established lines of communication. The party at Kerguelen Island was taken off by the Monongahela and carried to Cape Town, whence it took the regular steam-packet to England, and thence to New York. The other southern parties were carried in the Swatara to Melbourne, and thence returned to the United States by such routes as they preferred, the excess of expense thus incurred being defrayed by themselves.

Mr. Seebohm, chief photographer of the Chatham Island party, died at Bahia, Brazil, on his way out, having suffered exceedingly from seasickness during the passage. With this single exception, good health prevailed throughout, and no untoward incident occurred to interrupt or delay the progress of the several parties to their respective stations.

The commission on the transit of Venus is at present engaged in the re-examination and verification of the instruments used in the observations. It regards these observations, taken as a whole, and in connection with those of other nations, as satisfactory, and as promising valuable results.

The publication of the volume containing the observations has been placed in charge of the secretary of the commission.

SURVEYS FOR INTEROCEANIC CANAL.

Two expeditions have been sent out during the past year to complete the survey for an interoceanic canal across the great isthmus. One, an expedition under the command of Lieut. Frederick Collins, was sent in January, with instructions to make a careful survey of the proposed

Napipi Canal route, and to determine the character of the line in that vicinity found best suited to the construction of a ship-canal.

This expedition was transported to the Gulf of Urabá by the United States steamer Canandaigua, and thence up the Atrato to the field of operations in the boats of that ship. They arrived and commenced regular operations in the field on the 8th of February, and work was continued without interruption till the 28th of April. During this time a careful line of levels was run from the Atrato near the mouth of the Napipi to the Pacific, and the country along the line elaborately reconnoitered to develop its topographical features.

For the first five miles of the route swamps and morasses were encountered. From the swampy region to the Pacific the country was found to be extremely hilly. As long as the line followed the valley of the Napipi, however, it was found possible to avoid the greater part of the hills, but in the valley of the Doguado they could not be avoided, and in this section of the canal very deep cutting would be required.

The length of tunnel necessary to carry the canal under the dividing ridge, which attains a height of 778 feet, was found to be 3.5 miles. The total length of the canal line by this route, as determined by Lieutenant Collins, is 32.2 miles, and his estimates of the probable cost of the construction of a suitable canal, with all the works necessary for its preservation and successful operation, amount to $98,000,000.

The other expedition was under charge of Commander Edward P. Lull, and was directed to make surveys near the line of the Panama Railroad. This expedition sailed from New York on the 5th of January last, arrived at Aspinwall, United States of Colombia, on the 16th of the same month. Operations were at once begun and continued until the 3d of the following April, when the surveys were concluded.

The results obtained by the expedition are the location of a practicable line for an interoceanic ship-canal 26 feet deep from the bay of Aspinwall on the Carribean Sea to Panama on the Pacific. The total length of the line is 41.7 statute miles. Twelve lift-locks on each side will be required and one tide-lock at Panama, or twenty-five in all. The lift of the locks will be 10.3 feet each; that of the tide-lock 10 feet. It is proposed to cross the river Chagres by means of a viaduct 1,800 feet in length.

The water-supply is to be drawn from the river Chagres, and to be conveyed to the canal by a feeder 10.22 miles in length. The Chagres was found by careful gauging to discharge at an unusually low stage 55,900,800 cubic feet per day, a quantity considerably in excess of the maximum possible demand of the canal. Ample culverts are provided for the passage under the viaduct of all the superabundant waters of the Chagres in times of freshets.

The total estimated cost of opening a canal for ship-navigation through the Isthmus of Panama, is, after adding, to provide for contingencies, 25 per cent., to the computed cost, $94,911,360.

I have the honor also to transmit to you a report made to yourself by the distinguished commission appointed by you to consider the whole subject of communication by canal between the Atlantic and Pacific Oceans, over the Isthmus. This report is very concise, stating only results, and is made in advance of their more elaborate and final report giving the data upon which these are founded.

After a careful examination of all the routes proposed, their unanimous conclusion is that the one known as "the Nicaraguan Route," beginning at or near Greytown on the Atlantic side, and ending north of the Rio del Brito on the Pacific, affords the most advantages and presents the fewest difficulties of any route yet found across the Isthmus.

These conclusions will command the highest respect on account of the character of the commission and the labor bestowed by them upon their work, though on a subject so important, final opinion must be postponed till all the data can be given and considered.

CENTENNIAL EXHIBITION.

The centennial building, contracted for by the executive departments, ten thousand four hundred feet of which have been assigned for articles belonging to the Navy, is well advanced, and will probably be completed by January 1, 1876. The naval contributions to the exposition, under the skillful and intelligent superintendence of Rear-Admiral Thornton A. Jenkins, are in a state of forwardness. The Ordnance Department has already on the grounds specimens of heavy ordnance, rifled and smooth bore; and the Bureaus under the control of the Navy Department give promise of a fair exhibition of the scientific and practical utility of their various specialties, which cannot fail to be of interest to the people of the United States.

HYDROGRAPHIC OFFICE.

For the services rendered to hydrography and navigation by the United States Hydrographic Office during the last fiscal year, I refer you to the report of the hydrographer to the Bureau of Navigation. In my previous reports I have asked the attention of Congress to the requirements of this office, to the necessity of enabling it to furnish all that can be demanded in charts, sailing-directions, and hydrographic information to our commercial and naval marine. As progress in this branch must necessarily be slow where laborious compilation, construction of charts, and engraving are the accessories, it is more urgent that fair appropriations should be granted from year to year, to the end that the full usefulness of the office may be developed as quickly as possible. The survey of the Pacific Ocean, its dangers and reported dangers, was necessarily abandoned upon the completion of the survey of the Gulf of California and the mouth of the Colorado River, owing to the failure of Congress to grant the appropriation requested for its continuance.

The Department is fully alive to the necessity of conducting these

foreign surveys, especially in the Pacific Ocean, of employing our Navy officers during peace in a work so important to commerce and to geographical science, and of adding our mite to the explorations constantly carried on by other great maritime nations, in the surveying and mapping out the unsurveyed world, which still constitutes about one-half of the coasts and waters of the globe. It was with great regret that this Department was compelled to withdraw the United States steamer Narragansett, Commander George Dewey, from the survey of the Pacific Ocean. His work, commenced on the coast of Lower California and abandoned after the completion of the survey of the gulf, was well done, and gave promise of ability and accuracy in carrying out the further surveys contemplated by this Department. I recommend that this survey be continued; that two three-masted schooners be built or purchased for the completion of this work, and for service in surveys under the Navy Department. I also request that the amount requisite to complete the engraving of the charts of the Gulf and coast of Lower California, already constructed, may be granted.

Under the Hydrographic Office the work for the determination of the geographical positions of various points in the West Indies has been diligently prosecuted by Lieut. Commander F. M. Green and the officers of the United States steamer Fortune, and is now being continued by the same officers in the United States steamer Gettysburg, the Fortune having proved unfit for prolonged service at sea. This work calls for no extra expenditure, and the results thus far indicate its great importance. Much interest has been manifested in its success by geographers both at home and abroad, and the most gratifying courtesy and assistance have been extended to the officers of the expedition by both foreign authorities and the officials of the telegraph companies whose cables are being used for the determination of longitudes. The positions of Panama, Aspinwall, Kingston, Santiago de Cuba, and Havana have been determined with precision, and the work of extending the measurements through the Windward Islands to the continent of South America is now being performed. In connection with this work the commanding officer of the Gettysburg has been directed to collect material for the completion of a much-needed directory for the navigation of the West India Islands, and to make deep-sea soundings in various localities where the depths of the ocean have not been examined, and where such examination will be of scientific importance.

Should it be found practicable, it is the intention of this Department to continue these valuable observations along both coasts of South America, using the telegraphic cables for determining, with an accuracy otherwise unattainable, the vexed question of longitudes. The public spirit of the telegraph companies who have offered the use of their cables for longitude determinations is worthy of high commendation.

I would reiterate the opinion, expressed in my former reports, that the building at present occupied as the United States Hydrographic Office

is unsuitable for that purpose, from want of space and from having n fire-proof attachment, and I recommend, as heretofore, that means b taken as soon as possible for the convenience of the office and the safet of the valuable data there collected.

NAVY-YARDS.

For the past few years no appropriations for new buildings or othe works of improvement have been made for several of our navy-yards and the small amount appropriated for repairs and preservation ha proved insufficient to keep the buildings, stocks, and wharves in tha thorough state of repair and efficiency which should characterize a public works.

Kittery, Maine.—No new works have been built during the pas year. The workshops and wharves are in a fair condition, but repair will be necessary during the next year.

Boston.—No new works have been undertaken, all expenditure having been made for repairs. An appropriation for building a bound ary-wall on the west side of the yard is much needed, the only inclosur being a dilapidated wooden fence, part of which forms the site of large coal-shed situated upon the adjoining private property. In cas of fire, the property in the yard contiguous to this shed would be i much danger. Some of the buildings in the yard are old—temporar structures—unfit for the purpose for which they are used; and th necessity of an appropriation to supply their place is pressing. Th other objects submitted are for the purpose of facilitating the transpo tation of material; and the result of their construction will be a savin of labor and consequent economy.

New York.—Nothing has been done beyond the current repair The appropriations asked for the protection of that part of the yar bordering upon the Brooklyn docks, and for the improvement an enlargement of the ordnance-dock, are very much needed.

Quite a large area of new ground has been filled in during the pas year without cost to the Government, and is now valuable ground fo all purposes of the navy-yard.

I beg to renew the recommendation made in my last annual repor as to the conservation of this valuable navy-yard in its site and territor

Philadelphia.—In accordance with the acts of the last Congres measures have been adopted for the removal of the public property a this navy-yard to League Island, and it has been advertised to be sol at an early date.

League Island.—The large store-house for steam-engineering has bee carried up one story; the iron-plating shop is near completion; tempo rary wooden buildings have been erected for the protection of the pro erty from the Philadelphia navy-yard. The ship-houses at Philadelphi yard have been taken down and re-erected at League Island.

In view of the large amount of work to be done at this importan

naval-station, in order to place it in a condition to supply the requisite facilities for building and equipping vessels of war, liberal appropriations are urged as a measure of wise economy.

Washington.—No appropriation for repairs was made by the last Congress for this navy-yard, and the buildings will necessarily require a larger expenditure of money to place them in thorough condition than if the repairs had been continuously carried on. This yard contains a quantity of excellent machinery, and as a manufacturing-yard has no superior in this country.

Norfolk.—The excellent location of this navy-yard commends it to the favorable consideration of Congress. It has been partially rebuilt, but much yet remains to be done before it will be restored to its former state of efficiency. Appropriations are asked for an additional timber-shed and for a shell-house at Craney Island.

Pensacola.—During the past year the old hospital-building within the walls of the yard has been torn down and destroyed, and a new hospital erected upon the ruins of one without the walls, destroyed during the war.

While it is not deemed wise to place this yard in condition for building ships, yet it is considered eminently proper that it should possess all requisite facilities for docking and repairing the vessels of the North Atlantic squadron. Several additional buildings are necessary, and estimates are submitted for another timber-shed and a machine-shop for steam-engineering.

It is hoped that two sections of the iron sectional dock for this navy-yard will be finished during the present fiscal year.

Mare Island.—At this important naval arsenal the principal work during the past year has been upon the new stone dry-dock and upon the iron-plating shop. The work upon the dock has been pushed forward as rapidly as the small appropriations would permit, and thus far is well done, and reflects credit upon the engineer-in-charge. The estimate submitted for the continuance of the work is as small as a due regard to economy will sanction.

New London.—During the past year the new building for equipment-purposes has been completed, and the wharf accommodations much enlarged. An additional appropriation for the continuance of permanent improvements is recommended.

YELLOW-FEVER AT PENSACOLA.

This subject was particularly referred to in the last annual report of this Department, the officers and others at the navy-yard there having the previous summer and fall passed through an epidemic of a severe character, fatal to many of them. There has been more or less fear during the past season of the re-appearance of this disease within the limits of the station, particularly as it raged with extreme violence for several weeks at the military post, the Barrancas, near by. Unremitting efforts had been made by the commandant of the yard during last

winter and spring to put it in the best possible sanitary condition, which he had full authority and directions from the Department. soon as the fever appeared in the vicinity he was further authorized use all means in his judgment calculated to preserve the health of under his command and protect the public property under his char The yard had already been thoroughly fumigated and disinfected by t best means known; old infected buildings and materials had been remove and temporary quarters for hospitals, &c., provided. In addition to th a strict quarantine and its rigid enforcement, and the removal of the u acclimated to a safe locality in the vicinity, were adopted as the onl other means, save a total abandonment of the station, likely to secu immunity from a repetition of the previous calamity. These measur appear to have been well conceived and successfully executed; for whi the disease prevailed to a distressing extent at the military post, tl general health of the naval command was well preserved. A few cas of fever, attributed to violation of regulations, some of which prov fatal, occurred among the marines at the close of the season; but tl health of the station is now good, and all quarantine restrictions ha been removed.

TRAINING OF BOYS.

The Department has deemed it advisable to resume the enlistme of boys, to serve till reaching twenty-one years of age, under the existi laws enacted for that purpose. The great want of intelligent nativ born seamen to man our vessels has been seriously felt of late yea and it becomes a measure of national importance to remedy this ev Other nations have felt the growing scarcity of good seamen to m their navies, and are attempting, by establishing schools and trainin ships in their ports, to provide for the education and training of bo to become sailors. It is said that England turns out yearly 3,000 bo from her training-ships for her navy. Some efforts have formerly be made under the laws of Congress to enlist boys as apprentices, b they have failed, owing partly to the very elaborate system of edu tion and training adopted, and partly to the fact that inducemer were held out to the boys which could not be realized. Under t present system, which is purely experimental, about 250 have be enlisted and placed on board training-vessels, where they receive elementary English education, and are initiated in all the duties sailors on a man-of-war.

The object of the system adopted is solely to make the boys good a intelligent sailors for the Navy, without attempting to prepare them any higher grade. The Chief of the Bureau of Equipment, &c., repo very favorably of the progress of the experiment, and asks for t enactment of a law authorizing the enlistment of 500 boys, with outfit of $50 to each, which recommendation I earnestly recommend the favorable consideration of Congress.

TIMBER.

I am constrained to repeat the recommendations of my last report as to the wisdom, indeed, almost absolute necessity, of securing, before it passes entirely away, as great a quantity as possible of our sea-shore live-oak, the best ship-timber of the world. The rapid deterioration of all our vessels built of other wood constantly warns us how invaluable is this timber, now so rapidly passing away. As I have before said, it is the growth of centuries, and when once gone will never be replaced. The supply, which was never large, is being rapidly exhausted, and it becomes yearly more difficult to procure, as what is left is being eagerly bought up for shipment abroad. All that we had of it, laid up by the old Navy commissioners, was consumed during the war, and the Department has been endeavoring for the last few years, whenever it had the opportunity and the means, to secure what could be had for present use, or to be laid up to season for the future use of the Navy. All our new wooden ships have been built of it, and whatever building or repairs are done should be, as far as possible, of this lasting material, which is as useful for the backing of armored ships as for the frames of wooden cruisers. A quantity sufficient to build quite a number of ships has been gathered at the various navy-yards; and annexed to this report will be found a statement of what is required of this material to complete the frames for ships now on hand. But to buy a requisite amount of this expensive material out of current appropriations would cripple the Department too much in other things. In the opinion of the Department, measures should be taken, if possible, to prevent the exportation of such of this timber as is left on our southern coast, and to secure it for the use of the Government.

ORDNANCE.

This Bureau has been principally engaged in the routine duties of arming our men-of-war, and supplying the requisitions of squadrons and single cruising ships abroad.

At the same time experiments have been made with regard to the introduction of breech-loading howitzers into our system of boat-armament; and the results have been so satisfactory as to warrant their manufacture and issue as far as the limited appropriation will permit. A very powerful addition also to our boat-equipment is found in the Gatling gun, which is now issued to all ships.

The necessity for making some provision for arming our ships with rifled cannon is so obvious and pressing that, pending the construction of new guns, the Department proposes to convert a limited number of XI-inch smooth-bore guns into safe and efficient rifles by the insertion of wrought-iron tubes; the recent experiments in this direction, made by the

Army Ordnance, having clearly determined the practicability of making the conversion with safety and certainty.

A series of very interesting experiments in ordnance, made partly under a special appropriation and finished under contract with the Department, has just been concluded at Nut Island, in the harbor of Boston. These experiments have in view the possibility of utilizing the large supply of smooth-bore ordnance accumulated during the war, and converting them, at small expense, into rifled cannon of great range and power. The results are understood to be of a very favorable character, but the regular reports of the officers detailed to witness the experiments have not yet been submitted, though expected in a few days. When these are received and considered, I shall have the honor, with your permission, to submit them to Congress for such action as they may think best for the interest of the service.

An appropriation is recommended for the gradual armament of our ships with rifled cannon.

TORPEDOES.

The torpedo-school at Newport continues in a high state of efficiency, and the knowledge obtained by the officers in the manufacture and use of every description of this terrible means of warfare is of inestimable value to the service. A recent personal inspection of the station satisfies me that no branch of our naval system deserves more care and support.

In concluding his report, the chief of this Bureau calls attention again to the dangerous proximity of the naval magazine at Ellis's Island to the city of New York and to Jersey City. This subject has already been brought to the attention of Congress, and a board, appointed for the purpose of examining into the matter, made a report recommending the removal of the magazine to a point up the North River. No further action, however, was taken, and the magazine is still kept on the island.

THE MARINE CORPS.

The commandant of the Marine Corps makes a favorable report of the discipline and service of the officers and men of his command. The corps is reduced a thousand men from its authorized number by the limitation of the appropriation. More than two-thirds of the whole number are at sea, and the remainder are invaluable as the nucleuses of organization and drill, and as guards of the public property at the various stations. I think if Congress would provide that the officers of this branch of the naval service should be appointed from the Naval Academy, and subjected to regular examinations for promotion, the standing and efficiency of the Corps would be largely improved, and the Government would at the same time utilize to a larger extent the educational opportunities afforded to its beneficiaries at the academy.

NAVAL-PENSION FUND.

The following is a statement of the number and yearly amount of pensions of the Navy on the rolls November 1, 1875, and the amount which was paid during the last fiscal year:

	On the rolls November 1, 1875.	Pensions on rolls November 1, 1875.	Amount paid for pensions during the fiscal year ended June 30, 1875.
Navy invalids	1,690	$192,613 75	$185,675 82
Navy widows and others	1,824	295,960 00	334,672 65
Total	3,514	488,573 75	520,348 47

ESTIMATES AND EXPENDITURES.

The appropriations applicable to the fiscal year ending June 30, 1875, amounted, in the aggregate, to $19,273,731.27, and the actual expenditures for the same period, to wit, from July 1, 1874, to June 30, 1875, from these appropriations, amounted to $18,825,526.97, or about $450,000 less than the whole amount.

The appropriations made available for the current year, commencing July 1, 1875, amount, in the aggregate, to $18,301,306.90. The amount of these appropriations for the current year, drawn since July 1 and up to the last statement, is $11,019,004.36, which, after deducting the amount refunded during that period and the amount remaining in the hands of the paymasters and agents of the Government, will leave about nine millions as the sum actually expended from the current appropriations during the working summer months of the present year.

The monthly expenditure of the appropriations for the fiscal year 1874-'75 and for the present year, to the present month, will be found in the appendix to this report.

The following estimates have been submitted for the next year:

Estimates.

Pay of officers and seamen of the Navy	$7,600,000 00
Pay of civil establishment in navy-yards	210,000 00
Ordnance and torpedo corps	502,000 00
Coal, hemp, and equipments	1,500,000 00
Navigation and navigation supplies	115,000 00
Hydrographic work	67,800 00
Naval Observatory, Nautical Almanac, &c	46,000 00
Repairs and preservation of vessels, &c	3,305,000 00
Steam-machinery, tools, &c	1,800,000 00
Provisions	1,279,000 00
Repairs of hospitals and laboratories	20,000 00
Surgeons' necessaries	40,000 00

Contingent expenses of various departments and bureaus	365,000 00
Naval Academy	198,382 40
Support of Marine Corps	924,807 00
Naval Asylum, Philadelphia	58,177 00
Maintenance yards and docks	860,000 00
	18,891,166 40

The cost of the new buildings asked for, and the current expenses for repairs of all kinds to the docks, buildings, and public works at the various navy-yards and stations of the country, is estimated to require, in addition, the sum of $1,775,000.

This makes the whole amount of these estimates about $220,000 less than the amount asked for last year for like purposes.

There is also an additional sum of $1,957,000, asked for by the various bureaus and submitted by the Department, for various objects of pressing importance, but which are not necessarily included in the estimates for the general maintenance of the Navy proper.

CONDITION OF THE NAVY.

It is gratifying to be able to report that the Navy is now in a stronger and more efficient condition than it has ever been at any time, at least since the commencement of your administration. It is not very strong in the number nor in the classes of its ships; but what there are of them are in as good condition as it is practicable to keep such materials of war, under the various and trying conditions to which they are, in the nature of their service, constantly exposed. A far larger proportion than usual of our wooden ships are ready for service; our iron-clad fleet is efficient; our store-houses are fairly stocked with ordnance, equipments, and supplies, and we have on hand a fair supply of the best material for the building and repair of ships.

The service has been placed in this state of efficiency, compared with what existed a few years ago, by utilizing, except in the case of the eight sloops built under special appropriation, what could be spared from the current appropriations, and from the appropriations made during the Cuban emergency, and applying these means practically and steadily toward putting what was worth saving of the Navy, as it existed, in as permanent good condition as the state of the ships and the means at command permitted. The wisdom of this policy is, I think, illustrated by the strength of our position to-day. It would be also well, I think, if Congress would afford the means to finish at once the repairs of the five double-turreted monitors, since when they are finished, according to the present design, our iron-clad fleet will be much more powerful; and they are, while undergoing repairs, useless for any present purpose, and the process of repairing them out of what can be spared from current appropriations, not only cripples the Department in all its other operations, but is of course very slow. With these added to it, our iron-

clad force would, for purposes of defense, present a very substantial barrier to anything which would cross the seas and attempt to enter our ports.

IN CONCLUSION,

I beg to express my obligations to the chiefs and officers of the several bureaus of the Department for their good judgment, skill, and efficiency in the various branches committed to their care.

The Secretary is indeed greatly indebted to them, and to the experienced chief clerk of the Department, for the very valuable assistance constantly afforded him in the discharge of his duties.

GEO. M. ROBESON,
Secretary of the Navy.

The PRESIDENT.

SUPPLEMENT.

Exhibit of expenditure chargeable to Navy appropriations.

Date.	Drawn.	Refunded.	Expended.
Appropriations for 1874–'75.			
1874.			
July	$2,632,305 00	.....	$2,632,305 00
August	2,376,229 03	.....	2,376,229 03
September	2,705,056 29	$140 00	2,704,916 29
October	2,258,742 67	100,796 88	2,157,945 79
November	1,877,841 88	154,140 44	1,723,701 44
December	2,460,573 09	760,099 21	1,700,473 88
1875.			
January	1,671,148 54	416,050 28	1,255,098 26
February	1,061,027 01	201,968 77	859,058 24
March	1,476,529 24	269,336 77	1,207,192 47
April	1,541,966 84	555,555 15	986,411 69
May	859,787 72	227,224 19	632,563 53
June	693,192 27	103,560 92	589,631 35
	21,614,399 58	2,788,872 61	18,825,526 97
Appropriations for 1875–'76.			
1875.			
April	56,585 00	.....	56,585 00
May	12,008 00	1,243 92	10,764 08
June	29,750 00	.....	29,750 00
July	3,064,503 07	3 76	3,064,499 31
August	2,889,458 45	11,000 00	2,878,458 45
September	2,242,056 25	14,166 54	2,227,889 71
October	2,724,643 59	482,943 47	2,241,700 12
	11,019,004 36	509,357 69	10,509,646 67

MOVEMENTS OF VESSELS ON THE SEVERAL STATIONS.

THE NORTH ATLANTIC STATION.

The force on this station, under the command of Rear-Admiral J. R. M. Mullany, consists of the Worcester, (flag-ship,) 15 guns; Plymouth, 12 guns; Ossipee, 8 guns; Shawmut, 3 guns; Dictator, (iron-clad,) 2 guns; Canonicus, (iron-clad,) 2 guns: Pawnee, battery of howitzers; and the Pinta, 2 guns. The Powhatan, 17 guns; the Swatara, 8 guns; the Alert, 4 guns; the Huron, 6 guns. The Rio Bravo and the Despatch

have recently been added to it. The following vessels were also attached to the station part of the year: Colorado, Canandaigua, Wachusett, and Kansas.

The Worcester sailed from New Orleans March 22, 1875, and arrived at Pensacola on the 24th; sailed on the 27th for Havana, and arrived there on the 30th. On the 31st, Rear-Admiral Mullany shifted his flag to the Colorado, and on that day both vessels sailed for Sand-Keys, anchoring off there April 1; sailed on the 10th for Port Royal, anchoring off the bar on the 13th, and steamed to anchorage in the sound on the 19th. On the 13th of May, Rear-Admiral Mullany transferred his flag back to the Worcester, which vessel remained at Port Royal until the 28th of June, when she sailed for Norfolk, arriving there July 1; sailed from Norfolk for Colon, United States of Colombia, on the 2d of September, touched at Kingston, Jamaica, on the 10th, sailed on the 11th, and reached Colon on the 14th; sailed October 24 for Key West, touching at Kingston, Jamaica, on the 28th; sailed thence on the 30th, taking the windward passage, and running along the north side of Cuba, touched at Havana November 3, and thence to Key West, arriving on the 4th; sailed on the 6th and arrived at Hampton Roads on the 11th, and anchored off Norfolk on the 13th, where she remains.

The Plymouth having been ordered to the North Atlantic station, was put in commission October 10, 1874, and sailed from the navy-yard, Portsmouth, N. H., on the 21st; arrived at Boston on the 22d; sailed November 7, and arrived at Newport on the 8th; sailed, and arrived at New York on the 9th; sailed thence January 9, 1875, and arrived at Key West on the 20th; sailed April 8, touched at Havana, and arrived at Matanzas on the 10th; sailed thence on the 17th to Samana Bay, and thence to San Juan de Porto Rico, arriving there May 5; left Porto Rico on the 6th, and arrived at St. Thomas on the 12th; sailed on the 13th, arriving at Santa Cruz on the same day; sailed again on the 18th, and arrived at Sand Key, Key West, on the 29th; sailed thence June 4, and arrived at Port Royal June 7, with provisions for the squadron; sailed thence on the 25th, and arrived at Key West on the 29th; sailed for Rio Grande July 5, and anchored at the mouth of the river on the 11th; sailed August 20, to the aid of the Rio Bravo, ashore off Sabine Pass, arriving there on the 23d, and left the same day for the mouth of the Mississippi River; sailed thence on the 27th, and arrived at Port Royal September 6; sailed on the 8th, and arrived at Norfolk on the 14th, where she remains.

The Ossipee sailed from Samana Bay February 9, 1875, and arrived at Key West on the 20th; sailed April 7, and arrived at Vera Cruz on the 15th; left on the 17th, arriving off Tampico on the 19th; sailed thence on the 21st, and on the 24th anchored off Rio Grande; got under way again, and reached Galveston on the 27th; sailed thence on the 29th, and arrived at Pensacola May 5; sailed May 13 for Aspinwall, and arrived there on the 25th; sailed thence July 1, and reached Sand Key, Key West, on the 7th; sailed on the 10th, and reached Port Royal on the 13th; sailed August 9, and arrived at Norfolk on the 12th; sailed October 27, and arrived at Bridgetown, Barbadoes, November 9; thence to Port Royal, S. C., arriving November 26, where she remains.

The Shawmut sailed from New Orleans March 20, 1875, and arrived at Pensacola on the 22d; sailed on the 27th, and arrived at Key West on the 30th; sailed April 9, and arrived on the 11th at Nassau, N. P.; sailed on the 23d, and arrived at Watling's Island on the 24th; sailed on the 26th, and arrived at Port Royal, S. C., on the 30th; sailed May 11, and arrived at Port Royal, Jamaica, on the 29th; left June 3, and

arrived off Bonacca, Bay Island, on the 7th, and anchored the same day in the port of Medina; sailed on the 8th, and arrived on the 9th at Balize; sailed on the 14th, and reached Havana on the 17th; sailed on the 18th; reached Sand Key July 1; sailed on the 3d, and arrived at Port Royal, S. C., on the 5th; sailed on the 10th, and arrived at Norfolk on the 13th; sailed August 15 for Aspinwall, and arrived September 18, where she remains.

The Dictator sailed from Key West April 10, for Port Royal, towing the Pawnee, and anchored there on the 13th, where she remains.

The Canonicus arrived off New Orleans the 28th October, 1874, and is at present stationed there.

The Pawnee continued at Key West, as receiving and store ship, until April 10, 1875, when she sailed, in tow of the Dictator, for Port Royal, arriving there on the 13th, where she remains.

The Pinta was at anchor off Key West until November 25, 1875, when she sailed for New Orleans, arriving there December 3; sailed for Pensacola January 30, 1875, and arrived there on the 31st; sailed on the 3d of February, and arrived at Havana on the 6th; sailed on the 11th, and arrived at Key West on the 12th; sailed April 10, and arrived at Port Royal on the 13th, where she remains.

The Colorado sailed from Key West March 11, 1875, for Havana, where Rear-Admiral Mullany hoisted his flag temporarily on board, and sailed March 31 for Sand Key, Key West, arriving there April 1; sailed the 10th for Port Royal, arriving off light-ship on the 12th; came inside and anchored in Port Royal Sound on the 17th. On the 13th of May, Admiral Mullany having hauled down his flag and hoisted it on board the Worcester, the Colorado stood out to sea, but meeting with strong head-winds cast her anchor outside, and on the 14th sailed for Hampton Roads, where she arrived on the 20th; sailed thence for New York, arriving on the 30th, and went out of commission June 9.

The Canandaigua sailed from New Orleans January 7, 1875, for Aspinwall, United States of Colombia, and arrived there on the 18th; sailed March 20, and arrived at Cartagena on the 29th; sailed April 18, and anchored off the Atrato River on the 19th; took on board the surveying party and sailed May 6 for Aspinwall, arriving there on the 7th; sailed June 10, and arrived at Pensacola on the 16th; sailed thence and arrived at New Orleans July 2; left August 5, and arrived at Port Royal on the 31st, having been detained at the bar of the mouth of the Mississippi River, on her way to go to the relief of the Rio Bravo, until the 23d; sailed from Port Royal, and arrived at Norfolk September 18, and went out of commission November 8.

The Wachusett sailed November 7, 1874, from New Orleans, touched at Key West, and thence proceeded to Hampton Roads November 23, arrived at Norfolk December 5; sailed thence for Boston December 12, arrived there on the 20th, and went out of commission on the 29th.

The Kansas sailed from New Orleans November 7, 1874, and arrived at Key West on the 13th; sailed thence on the 26th, and arrived at Havana on the 27th; sailed on the 28th, and anchored December 3 at Cape Haytien; sailed December 5; at Samana Bay on the 7th; sailed on the 8th for St. Domingo City, but encountered a norther and had to put back to Curaçoa for coal, anchoring there on the 15th; left Curaçoa on the 17th, touched at Puerto Cabello on the 19th, sailed on the 21st, and arrived at La Guayra on the 22d; sailed thence same day, and arrived at Aspinwall on the 27th; remained there until the 2d of January, 1875, and proceeded thence to Havana, arriving on the 11th; sailed on the 18th, and arrived at Key West on the 19th; sailed Feb-

ruary 23, and arrived at Pensacola March 1; sailed on the 10th, and arrived at New Orleans on the 12th; left New Orleans July 5, and arrived at Pensacola on the 6th; sailed on the 8th for Portsmouth, N. H., arriving there on the 21st, and went out of commission August 10.

SOUTH ATLANTIC STATION.

The force at present on this station consists of the flag-ship Brooklyn, the Monongahela, the Wasp, and the Frolic, and is under the command of Rear-Admiral William E. Le Roy.

The Lancaster, which had been the flag-ship of the station, sailed from Rio de Janeiro April 22, at which port she had arrived, April 10, from Montevideo. In consequence of yellow fever on board she put into Bahia, Brazil, arriving there May 9, and, sailing again the 20th, she reached Hampton Roads June 26; proceeded thence to Portsmouth, N. H., arrived July 12, and, after serving out quarantine, was put out of commission July 31.

The Brooklyn left the navy-yard, Norfolk, 23d of January, 1875, for the South Atlantic station, to be the flag-ship, and arrived at Rio de Janeiro May 20, 1875, and Rear-Admiral Le Roy hoisted his flag on board. She left Rio de Janeiro 6th September for Santa Catharina, and arrived there on the 12th and practiced with boats; left 2d October, and arrived at Montevideo on the 8th; she was still there 12th October, the date of the last report.

The Monongahela left Rio de Janeiro October 1, 1874, for the Kerguelen Islands, to bring away the observers of the transit-of-Venus expedition: arrived at Cape Town on the 29th October, 1874; left on the 16th November; arrived at Royal Sound, Kerguelen Islands, December 9; left Kerguelen Islands 12th January, 1875, and arrived at Cape Town February 6; sailed, and arrived at Rio de Janeiro April 19. On the 21st April, Rear-Admiral Le Roy transferred to her his flag temporarily, until the arrival of the Brooklyn, May 2. She proceeded southward and visited Santa Catharina, and returned to Rio de Janeiro June 23; left Rio de Janeiro for Montevideo July 1, and arrived on the 10th; left Montevideo August 11, for Rio de Janeiro.

The Wasp left Montevideo December 4, 1874, with General Caldwell, United States minister, for Asuncion, and, after a short stay, returned to Montevideo. April 13, 1875, left for the Rosario River, for target-practice; April 18, left for Lujan River; 24th April, commenced preliminaries for surveying the Lujan, Capitan, Alavieja, and Currabelas Rivers; was engaged surveying from the 26th to 30th; left Lujan, and arrived at Buenos Ayres May 10; 14th to 21st was off Calonia surveying; 21st, left Calonia for Montevideo; 22d, arrived; October 12, 1875, was ordered to Calonia to protect American interests, on account of information received from the United States consul.

The Frolic was put in commission August 18, 1875, at Philadelphia, and ordered to Norfolk; left navy-yard, Norfolk, on the 29th September, for the South Atlantic station, to take the place of the Wasp. She touched at the Bermudas, arriving October 6, and at Bridgetown, Barbadoes, arriving October 21, at which place she was heard from October 22.

EUROPEAN STATION.

The following vessels comprise the force on the European station under the command of Rear-Admiral John L. Worden, who relieved

Rear-Admiral A. Ludlow Case, February 3, 1875: Franklin, (flag-ship,) 39 guns; Congress, 16 guns; Alaska, 12 guns; Juniata, 8 guns.

The movements of the vessels have been as follows:

The Franklin left Villefranche and sailed for Lisbon, arriving there on the 3d of February, 1875, and on that day Rear-Admiral Worden hoisted his flag on board and assumed command of the European station. On the 11th sailed for Tangier, arriving there on the 13th; left Tangier February 17, and proceeded to Gibraltar, arriving there the same day; sailed from Gibraltar on February 20, for Villefranche, arriving there on the 25th; sailed thence on April 15, and arrived at Spezzia April 17; sailed thence on the 6th of May, and reached Villefranche on the 7th of May; left Villefranche May 17, and arrived at Gibraltar May 22; sailed from Gibraltar May 27 for the German coast; on June 5, took a Channel pilot, and on the 6th anchored for a short time off Deal, and on the 8th entered the Elbe and proceeded up the river to an anchorage off Glückstadt, where she remained until the 20th of June, when she sailed for Kiel, arriving there on the 24th; and sailed July 1 for Stockholm, anchoring twelve miles below that city July 5; sailed July 11 for Cronstadt, Russia, arriving there on the 13th; left Cronstadt July 20, visited Copenhagen, and arrived off Southampton August 9; left Southampton August 30, and arrived at Lisbon September 5, and then proceeded to Villefranche, where she was when last heard from.

The Congress at Villefranche, March 2, 1875; left Villefranche 28th May, and arrived at Malaga June 3, where she remained until the 8th, making a survey of a supposed shoal off that harbor, and then sailed for Gibraltar, arriving there on the 9th; left Gibraltar on the 15th, and arrived at Algiers on the 18th; sailed on the 28th, and arrived at Goletta, Tunis, July 1; sailed on the 5th, and arrived at Malta on the 7th; sailed on the 13th, and arrived at Tripoli on the 14th; sailed on the 17th, and arrived at Alexandria on the 24th; sailed on the 31st, and arrived at Corfu August 5; sailed on the 12th, and arrived at Tripoli on the 17th; sailed on the 28th, and arrived at Corfu on the 31st; sailed on the 2d of September, and arrived at Trieste on the 6th; sailed on the 29th, and arrived at Venice the same day; sailed on the 2d of October, and arrived at Naples on the 7th; sailed on the 10th, and arrived at Villefranche on the 13th of October.

The Alaska, at Spezzia, undergoing repairs March 2, 1875, came out of docks April 8; left Spezzia May 10, and arrived at Genoa the same day; left Genoa May 15, and arrived at Villefranche on the 16th; left Villefranche May 18, and arrived at Gibraltar on the 22d; left Gibraltar on the 24th, and arrived at Cadiz on the same day; left Cadiz on the 25th, and arrived at Lisbon on the 26th; left Lisbon on the 31st, and arrived in the river Elbe June 8, and anchored near Glückstadt June 10; went up to Hamburg, bearing the flag of Rear-Admiral Worden, on the 19th; returned to the anchorage June 20; sailed for Kiel, arriving there June 24. July 1, sailed for Stockholm, and on the 5th anchored twelve miles below that city. Sailed July 11 for Cronstadt, Russia, and arrived there on the 13th; left Cronstadt July 20, arriving at Southampton August 4; left Southampton August 28 for Lisbon, leaving that port September 10, and arrived at Gibraltar on the 19th; sailed for Carthagena on the 22d, arriving there on the 23d; sailed for Alicante on the 25th, and arrived there on the 26th; sailed for Valencia on the 27th, and arrived there on the 28th; sailed for Tarragona on the 2d of October, and arrived there on the 3d; sailed for Villefranche and arrived there on the 9th.

The Juniata at Villefranche March 2, 1875; left Villefranche April

15, and arrived at Spezzia April 17; left Spezzia on May 6 and reached Villefranche on the 7th; sailed May 17 and arrived at Gibraltar on the 22d; sailed from Gibraltar for the German coast, and on the 30th, her machinery being disabled, put into Lisbon, arriving there on the 31st; sailed from Lisbon June 9, and arrived at Hamburg on the 20th; and as her machinery was again broken, remained there for repairs; and thence to the Downs; and thence to Southampton, arriving there August 9; sailed thence on the 28th, and arrived at Villefranche September 3; and thence to Lisbon; left Lisbon on the 9th, and arrived at Gibraltar on the 11th; sailed on the 13th and arrived off Tetuan, Barbary, the same day; sailed thence on the 14th, and arrived at Oran, Algeria, on the 16th; thence on the 18th, and arrived at Algiers on the 19th; sailed from Algiers on the 22d for Malta and the ports of Egypt and Syria.

NORTH PACIFIC STATION.

The force on this station, under the command of Rear-Admiral John J. Almy, consists, at present, of the Pensacola, (flag-ship,) 22 guns; Benicia, 12 guns; Tuscarora, 6 guns.

The Saranac, 11 guns; Portsmouth, 14 guns; and Narragansett, 6 guns, have been a portion of the year on this station.

The movements and proceedings of the vessels have been as follows:

Pensacola, second rate, wooden, screw, 22 guns, under the command of Capt. Bancroft Gherardi, in November and December, 1874, was undergoing repairs at the navy-yard, Mare Island, California. The early part of January, 1875, at anchor off Mare Island, awaiting arrival of His Hawaiian Majesty, whom she was to convey to Honolulu. On 2d February, received His Majesty on board, and sailed for Hawaiian Islands; arrived on 15th instant, and remained moored of Honolulu until the 28th. On the 12th instant, it being the first anniversary of the election of His Majesty to reign over the kingdom and people of Hawaii, although at sea, the flags were hoisted and carried through the day, the Hawaiian royal standard at the main. At 1 p.m. all the officers of the ship in a body, and in appropriate uniform, called to pay their respects to the King and offer their congratulations, which he seemed to appreciate highly.

During the month of March, at anchor in harbor of Honolulu, and exercised crew daily at routine drill and exercises of sails and spars.

Remained at anchor during the month of April, and exercised regularly at masts, yards, sails, boats, &c. On 10th May sailed on a cruise to the other islands of Hawaiian group; visited Lahaina on May 11, Mokena Bay on 14th, and Hilo on 17th, and remained until end of month; until 4th of June making passage from Hilo to Honolulu; remained at Honolulu until 29th July, when sailed for a month's cruise among the islands; anchored off Lahaina 30th and 31st July; during August cruising among Hawaiian Islands, visiting the islands of Maui and Hawaii; on the 25th September, at anchor off Honolulu, and sailed that day for Lower California and west coast of Mexico.

Saranac, second rate, wooden, paddle, 11 guns, under the command of Capt. W. W. Queen, visited La Paz, in Lower California, in November, 1874, and cruising on special duty in Gulf of California and on passage to San Francisco, where she arrived on the 28th November. She visited Guaymas, Mazatlan, and San Blas, and La Paz twice, spending some time there, owing to the troubles, and her presence was of very great service. During December, 1874, January and February, 1875, was at anchor off San Francisco, and had orders to proceed on a cruise northward about middle of March, if ready for sea; sailed from San

Francisco on 7th June for Alaska, under special orders from the Navy Department, and was totally lost in Seymour Narrows, British Columbia, on the 18th June, by being driven by a strong current against a sunken rock.

Benicia, second rate, wooden, screw, 12 guns, under the command of Capt. Wm. E. Hopkins; until 17th of November, 1874, at anchor in harbor of Honolulu, Hawaiian Islands, awaiting embarkation of His Majesty the King of the Hawaiian Islands, and sailed that day with the King for San Francisco, arriving on the 28th. On the 2d December proceeded to convey His Majesty King Kalakaua to Mare Island. Returned to San Francisco and remained at anchor until the 10th instant, when she proceeded to Mare Island, where she remained during the balance of the month. She was ordered to proceed northward about the middle of March, and during April was cruising in the Alaskan waters. At anchor in the port of Esquimolt until 7th of June, when she sailed for San Francisco, arriving on the 13th. During July she sailed for Esquimolt, (Victoria,) British Columbia, where she remained until the 12th, and, returning to San Francisco, arrived on the 17th.

Portsmouth, third rate, wooden, sails, 14 guns, under command of Commander Joseph S. Skerrett. In November, 1874, was engaged in examining Kodiak Islands with Icelandic commission and making passage to San Francisco. During December was at anchor off San Francisco; remained at anchor until the 4th January, 1875, when she sailed for Honolulu, Hawaiian Islands, and was engaged remainder of month making passage to that place. During February was at anchor off Honolulu preparing for cruise to west coast of Mexico and Central America. On the 4th March sailed for Gulf of California and west coast of Mexico, and during April, May, and June was cruising, and until the 14th July making passage from Acapulco to San Francisco. The remainder of month at anchor either there or at Mare Island.

Tuscarora, third rate, wooden, screw, 6 guns, under command of Commander Henry Erben; sailed from San Francisco on November 1, 1874, for Honolulu, and during passage to that port will run a line of deep-sea soundings, as directed by the Department. During December, 1874, and January, 1875, was at anchor in Honolulu, Hawaiian Islands, preparing for a cruise to the Samoan Islands. On the 4th March sailed for Samoan Islands, having on board, as passenger, Mr. A. B. Steinberger, United States commissioner to that group of islands. During April was on special service among islands of Samoan group and until 20th June, making passage to Honolulu, and from that date until end of month at anchor in harbor preparing for sea under orders to San Francisco. Her mission to Samoan Islands was very successful, uniting the different chiefs in electing a king, in forming a constitution, and establishing a national flag. She sailed for San Francisco on 17th July.

SOUTH PACIFIC STATION.

The vessels now on this station are the Richmond, (flag-ship,) 14 guns; Omaha, 12 guns; and Onward, 3 guns. The movements of the vessels have been as follows:

Richmond, (flag-ship.) The Richmond arrived at Panama on the 28th of September, 1874, and sailed on the 16th of November direct for Valparaiso, and arrived at Bay of Conception, Chili, on the 26th January, 1875; on the 22d March she was at anchor in the harbor of Talcahuana, Chili; on the 17th April, at Valparaiso, where she remained until May 8, sailing on that day for Coquimbo; on the 31st May at Caldera, Chili;

on the 4th June sailed for Iquique, Peru, arriving on the 10th; at Arica, Peru, on the 13th; Callao on the 25th June; on the 9th August, 1875, Rear-Admiral Napoleon Collins died, and was succeeded in command by Rear-Admiral Reed Werden, who hoisted his flag on the 25th September, at Panama; sailed for Callao on the 25th October.

Omaha, 12 guns, left Callao on the 10th October, 1874, bound to Valparaiso direct. She sailed from Valparaiso on the 4th February, 1875, for Talcahuana, Chili, where she arrived on the 13th, remaining at anchor until the 11th March, when she sailed for Valparaiso. On the 9th April she was at Mejillones de Bolivia, on her way to the northward; at Arica, Peru, on the 18th; at Molenda, Peru, on the 30th; on the 10th May at Pisco, Peru; on the 25th June sailed for Panama; at Panama on the 25th October.

The Onward has been stationed during the past year at Callao, as store-ship for the South Pacific station.

ASIATIC STATION.

The force on this station, under the command of Rear-Admiral A. M. Pennock, consisted of the Hartford, (flag-ship,) 18 guns; Monocacy, 6 guns; Saco, 3 guns; Lackawanna, 10 guns; Palos, 6 guns; Yantic, 3 guns; Kearsarge, 6 guns; and the Ashuelot, 6 guns. The Hartford was ordered home in June, 1875, Rear-Admiral A. M. Pennock, in anticipation of the arrival of Rear-Admiral William Reynolds, in his flag-ship Tennessee, 23 guns.

The movements of the vessels on this station since the latter part of the year 1874 have been as follows:

The Hartford left Nagasaki on the 21st of October, 1874, arriving at Shanghai on the 23d. February 9, 1875, left Woosung, the anchorage for Shanghai, and arrived at Hong-Kong February 14; sailed from Hong-Kong, March 13, for Whampoa, where she remained ten days. Left Whampoa on the 25th of March, and arrived at Hong-Kong March 26, 1875. June 16, 1875, sailed for Singapore, and from thence to the United States, via Suez Canal. June, 1875, Rear-Admiral Pennock left Yokahama to return to the United States, leaving Commander R. F. R. Lewis, as senior officer, in command of station. The Hartford visited Tripoli, on her return, where she remained from the 17th to the 28th of August, to inquire in regard to reported insults to the American consul. She arrived at New York, October 23, and was put out of commission October 29, 1875.

Rear-Admiral William Reynolds, having been ordered to relieve Rear-Admiral Pennock, hoisted his flag on board the Tennessee June 17th, 1875, and left New York June 26; arrived at Gibraltar July 13; left July 29, and arrived at Palermo August 1; sailed from Palermo on the 7th of August, and arrived at Port Said, Egypt, August 12; left Port Said August 14; passed canal easily, and arrived at Suez August 15; and, being within the limits of the Asiatic station, Admiral Reynolds assumed command thereof; left Suez August 21, and arrived at Aden August 26; left Aden August 28, and arrived at Bombay September 4; filled up with coal to leave September 11 for Colombo, Ceylon, and thence to Pulo Penang, and to Singapore; arrived at Colombo September 15, and Penang September 26, six days from Colombo.

The Monocacy finished repairs, September 4, 1874, and sailed November 10, for Hankow, arriving at Chin-Kiang on November 12, where she remained 2 days, at Nanking on the 15th, Kinkiang on the 20th; re-

mained there three days, and reached Hankow November 25; left Hankow December 29, and arrived at Shanghai January 2, 1875; remained there a week and then went to Nagasaki, Yokahama, and Kobe. She remained on the coast of Japan until the typhoon season was over and then sailed for Tien-tsin, China.

The Saco sailed from Shanghai November 28, 1874, for Amoy and Hong-Kong; from Hong-Kong, made a cruise westward to search for the wreck of the Pacific mail steamship Japan; then visited the west coast of Sumatra and Pulo Penang, which latter port she left February 20, 1875; arrived off Acheim Head February 22, and proceeded thence to Qualla Battoo, Soe-soe, Mukkie Pading, and Batavia, arriving at the last-named place March 6; left Batavia March 22, and arrived at Singapore March 26; after remaining there two weeks, sailed April 8 for Borneo, Manila, and Hong-Kong, arriving at last-named port May 3. On the 13th, left Hong-Kong, to cruise on the coast of China to Turnabout Point, thence to Nagasaki, Kobe, and Yokahama, at which last-named place Admiral Pennock temporarily hoisted his flag to her, June 22; arrived at Yokahama in October.

The Lackawanna sailed from Yokahama for San Francisco March 10, 1875; arrived at Mare's Island April 23, and went out of commission May 18, 1875.

The Palos left Chefoo November 8, 1874; reached Tien-tsin November 11, 1874; left Tien-tsin March 29, 1875, for Shanghai, arriving there April 9, and was put under returns of October 5, at that port.

The Yantic, from Hong-Kong, made a cruise in search of the Pacific mail steamship Japan, returning December 22, 1874; left Hong-Kong March 15, 1875, for target-practice, and returned on the 16th; left again May 11, to protect parties engaged in recovering treasures from the wreck of the Pacific mail steamship Japan from pirates; September 1, at Yokahama, undergoing repairs.

The Kearsarge left Vladoistich December 16, 1874, with the transit-of-Venus party on board, for Nagasaki. After landing the party she proceeded to Shanghai, thence to Hong-Kong; sailed March 13, 1875, for Manila, where she arrived on March 18; left Manila March 29, and arrived at Hong-Kong April 3; sailed April 6 for Canton, where she remained until April 21, and then returned to Hong-Kong; May 1 sailed for Nagasaki, Kobe, and Yokahama; August 19 sailed for the north coast of China; was reported at Chefoo in October.

The Ashuelot landed Professor Watson and party at Tien-tsin, and proceeded to Ninghai, Nienchwang, Tang-chang-foo, and Chefow, leaving the latter port November 2, 1874, and arrived at Shanghai November 6; left Shanghai December 8 for Nagasaki; August, 1875, cruised in the vicinity of Ningpo Foochow, and proceeded thence to the locality of the wreck of the late Pacific mail steamship Japan, to protect parties engaged in recovering treasure from pirates.

APPENDIX.

No. 1.

ESTIMATES SECRETARY'S OFFICE.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1877, by the Navy Department.

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1876.
SALARIES.		
Secretary, per act of March 3, 1875, (18 Stat. at L., page 362)	$8,000 00	
Chief clerk, per act of March 3, 1875, (18 Stat. at L., page 362)	2,500 00	
Disbursing-clerk, per act of March 3, 1875, (18 Stat. at L., page 362)	2,000 00	
Four clerks of class four, per act of March 3, 1875, (18 Stat. at L., page 362)	7,200 00	
Four clerks of class three, per act of March 3, 1875, (18 Stat. at L., page 362)	6,400 00	
Two clerks of class two, per act of March 3, 1875, (18 Stat. at L., page 362)	2,800 00	
Three clerks of class one, per act of March 3, 1875, (18 Stat. at L., page 362)	3,600 00	
Two messengers, at $840 each, per act of March 3, 1875, (18 Stat. at L., page 362)	1,680 00	
Two laborers, at $620 each, per act of March 3, 1875, (18 Stat. at L., page 362)	1,440 00	
	35,620 00	$35,620 00
CONTINGENT EXPENSES.		
Stationery, furniture, newspapers, and miscellaneous items, appropriated, (18 Stat. at L., page 362)	5,000 00	5,000 00
SALARIES SUPERINTENDENT, ETC.		
Superintendent, (appropriated)	250 00	
Five watchmen, at $720 each, (per act of March 3, 1875)	3,600 00	
Two laborers, at $720 each, (per act of March 3, 1875)	1,440 00	
	5,290 00	5,290 00
CONTINGENT EXPENSES NAVY DEPARTMENT BUILDING.		
Incidental labor, fuel, lights, and miscellaneous items, (per act of March 3, 1875)	7,000 00	7,000 00
PUBLIC PRINTING AND BINDING.		
For the public printing, for the public binding, and for paper for Navy Department, (appropriated)	65,000 00	65,000 00
POSTAGE, NAVY DEPARTMENT.		
For official postage-stamps for the Secretary's office and the bureaus of the Navy Department	20,000 00	20,000 00
CONTINGENT, NAVY.		
Rent and furniture of buildings and offices not in navy-yards; expenses of courts-martial and courts of inquiry, boards of investigation, examining boards, with clerks' and witnesses' fees, and traveling expenses and costs; stationery and recording; expenses of purchasing paymasters' offices at the various cities, including clerks, furniture, fuel, stationery, and incidental expenses; newspapers and advertising; foreign postage; telegraphing, foreign and domestic; copying; mail and express wagons, and livery and express fees and freight; all books for the use of the Navy; experts' and detectives' fees, and costs of suits; commissions, warrants, diplomas, and discharges; relief of vessels in distress, and pilotage; recovery of valuables from shipwrecks; quarantine expenses; care and transportation of the dead; reports, professional investigation, and information from abroad; and all other emergencies and extraordinary expenses arising at home or abroad, but impossible to be anticipated or classified, (18 Stat. at L., page 297)	125,000 00	100,000 00

Estimates of appropriations required for the service of the fiscal year, &c.—Continued.

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1876.
NAVY-YARD, BOSTON.		
For boundary-wall	$20,000 00	.....
For Yards and Docks, workshop	40,000 00	.....
For tracks and cars	20,000 00	.....
For paving and grading	10,000 00	.....
For wet-basin, completing	10,000 00	.....
NAVY-YARD, NEW LONDON.		
For commencing permanent improvements	40,000 00	$10,000 00
NAVY-YARD, NEW YORK.		
For retaining crib-work, cob-dock	75,000 00	.....
For the crib-work on the east and southeast faces of the ordnance-dock, filling in, grading, and improving said dock, planking face of the dock, laying iron shot beds; laying railroad between the avenues of gun-park to facilitate moving of guns, &c	25,000 00	.....
For timber and knee-basin, completing	40,000 00	.....
NAVY-YARD, LEAGUE ISLAND.		
For continuing work of preparation	500,000 00	.....
NAVY-YARD, NORFOLK.		
For timber-shed, No. 32	25,000 00	.....
For building shell-house at Craney Island	20,000 00	.....
NAVY-YARD, PENSACOLA.		
For timber-shed, No. 11	20,000 00	.....
For machine-shop, Steam-Engineering	80,000 00	150,000 00
NAVY-YARD, MARE ISLAND.		
For continuance of begun work	300,000 00	200,000 00
ADDITION TO QUARTERS, NAVAL ACADEMY.		
For a wing additional to the quarters of the cadets, for the improvement of the sanitary condition of the building, and for the more comfortable accommodation of the cadets	50,000 00	10,000 00
For repairs at different navy-yards and stations, and the preservation of the same	500,000 00	500,000 00
	1,775,000 00	.....
SUPPLEMENTARY.		
The following additional estimates submitted by the various Bureaus for objects not necessarily included in the estimates for the general maintenance of the Navy, but necessary to its proper operation and efficiency, and most desirable for the service and the country, are also recommended by the Department for consideration and appropriation by Congress:		
A.—*Submitted by Bureau of Navigation.*		
For the purchase, or construction under contract and equipment of two three-masted schooners for surveying in the Pacific	60,000	.....
For engineering-charts, the results of Pacific surveys	20,000	.....
B.—*Submitted by Bureau of Construction and Repair.*		
Repairing the Puritan and Dictator	300,000	.....
Repairing and fitting six school-ships for boys, to be turned over to States as per act of Congress approved June 20, 1874	300,000	.....
Building two iron rams	300,000	.....
C.—*Bureau of Steam Engineering.*		
For the construction of new boilers for the Shenandoah, Wachusett, Alaska, Benicia, Wabash, Lancaster, and Juniata	400,000	.....

Estimates of appropriations required for the service of the fiscal year, &c.—Continued.

Detailed objects of expenditure, and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1876.
D.—*Bureau of Ordnance.*		
For the battery of the new sloop Trenton, and as a reserve twenty smooth-bore 11-inch guns converted to 8-inch rifles, at $2,700	$54,000	.....
Twenty carriages for same, at $1,800	36,000	.....
For the armament of five double-turreted monitors, viz, Puritan, Monadnock, Miantonomah, Amphitrite, and Terror, which are to be completed within this fiscal year:		
Twenty 12-inch rifles, at $15,000	300,000	.....
Twenty carriages, at $6,000	120,000	.....
E.—*Bureau of Equipment and Recruiting.*		
For the pay of 500 boys, recommended to be enlisted for training, at an average pay of $120 per annum	60,000	.....
F.—*Commissioners on transit of Venus.*		
For reductions of the observations of the transit of Venus	7,000	.....
	1,957,000	.....

No. 2.

NAVAL ACADEMY.

UNITED STATES NAVAL ACADEMY,
Annapolis, Md., November 17, 1875.

SIR: I have already had the honor to submit the very satisfactory report of the practice-cruise of the cadet-midshipmen in the Constellation, under the command of Commander Edward Terry, commandant of cadets, and of the cadet-engineers, in the Alert, under the command of Commander W. T. Sampson, head of the department of physics and chemistry.

The usual course of studies has been pursued satisfactorily, and the professors and officers under my command have been able, and devoted to their duty.

I beg to submit the following recommendations, and I cannot urge them too strongly:

1st. That the system pursued at West Point, of appointing cadets at least one year before they shall present themselves for admission, be adopted at the Naval Academy.

2d. That Congress be moved to make the necessary appropriation to build an additional wing to the new cadet quarters, so that the cadets may be quartered under one roof, to the great benefit of their discipline, their health, and the economy of the administration of the school.

I am, sir, very respectfully, your obedient servant,

C. R. P. RODGERS,
Rear-Admiral and Superintendent.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

REPORTS OF PRACTICE-CRUISE.

UNITED STATES STEAMSHIP CONSTELLATION, (3d rate,)
Annapolis, Md., September 18, 1875.

ADMIRAL: I have the honor to submit the following report of the practice-cruise of this vessel during the past summer, and to inclose reports of the professional aptitude and attention to duty of the cadets on board.

I assumed command of the Constellation, on her arrival at Annapolis, June 7, and on the 22d of the same month the cadet-midshipmen who were to make the cruise embarked. The following day the ship crossed the bar and anchored in the outer roads. The cadets were stationed in the watch and station bills with the crew, first-class men having its numbers of seamen, and the third-class men those of ordinary seamen.

On June 26 your flag was transferred from the Santee, and we weighed and stood down the bay, having on board thirty-nine cadet-midshipmen of the first class and one of the second class, and thirty-eight of the third class.

The following officers were attached to the ship: Lieut.-Commander C. M. Chester, as executive; Lieut.-Commander S. H. Baker, navigator; lieutenants, C. S. Sperry, S. A. Simons, E. P. Wood, C. C. Cornwall, R. P. Rodgers, and J. B. Briggs; chaplain, J. R. Matthews; paymaster, Edward May; surgeon, T. N. Penrose; assistant surgeon, J. C. Boyd; boatswain, Andrew Milne; gunner, Robert Sommers. Lieutenant Rodgers was assigned instructor in navigation, and the sections of the third class in seamanship were in charge of the watch officers, and were alternated each month.

Off Cape Henry, on June 30, you transferred your flag to the Alert and we sailed for New Bedford, arriving July 4. From that date until the end of our cruise we confined our exercising mostly to Buzzard's Bay.

Cadet-Midshipman Gilmore, of the first class, joined the ship from sick-leave, July 17, and on August 1, Cadet-Midshipman Braunersreuther, of the first class, and twelve cadets of the third class, also reported for duty.

On the 18th of August we anchored in Newport harbor, returning to Buzzard's Bay on the 26th.

September 1, we sailed for the Chesapeake, arriving off the capes the evening of the 4th.

On the 9th I received orders to discharge stores and ammunition at Norfolk, and being unable to procure a tug and lighter from the yard to come to the roads, I was obliged to take the ship to the city.

In obedience to instructions received from you, I proceeded to Annapolis as soon after as possible, anchoring in the outer roads September 15.

During the cruise a weekly detail has been made, from the first class, of midshipmen of the forecastle, quarter-deck, and tops, and mates of decks and hull; and with all hands called, and a midshipman in charge of the deck, a detail for gangways, forecastle, and quarter-deck.

The gentlemen of this class have had, I believe, unusual opportunities in charge of the deck for working ship and performing the various evolutions known to seamen.

The opportunities have been mainly owing to the character of our cruising-ground and the prevalence of suitable weather for our work.

In navigation the first-class men have been instructed in the various methods of determining the position of a ship at sea, and have performed

the following work, using their own observations in every case, viz: latitude and longitude by dead reckoning; course and distance made good; bearing and distance of port; current; longitude, by time-sights, of sun, moon, and star; latitude by meridian altitude of same, by observation of sun off the meridian, by three different methods, and by altitude of * Polaris; determination of deviation by azimuth and by amplitude of sun; determination of time of high-water and of sunset; of ship's position by Sumner's method and by cross-bearings. They have also filled in the coast-line between Cape Hatteras and Cape Cod on skeleton charts, and have constructed a Mercator's chart of Buzzard's Bay and Vineyard Sound.

They have plotted the ship's track on the coast-chart, and have measured linear distances. Scale sketches have been made by them from our various anchorages, and descriptions written in their sketch-books.

The third class have kept seamanship note-books, in which they have described, and illustrated by drawings, the fitting and lead of all the rigging of this ship.

They have been taught to heave the log, get a cast of the lead, and steer, and have had frequent exercise aloft. Examinations in seamanship were held to test their progress.

About fifteen of this class, who have shown the most aptitude, have determined the ship's position by dead reckoning, and have also found the latitude by meridian altitude of the sun, and longitude by time-sight of same.

While your flag was flying on board this ship in Buzzard's Bay, the first class was sent on board the Alert, while fires were hauled to examine her engines; and again, while she was under steam in the bay, to witness their working. Subsequently, the same class went on board of her to work her under sail.

While at Newport, through the kindness of Captain Breese, during a portion of two days, the cadets of the first class were shown about the station, and as much information imparted to them as time would permit. They were afterward required to make notes concerning their visit. The third class also visited the torpedo station.

In order that the cadets should have as much recreation as possible, they were generally allowed to visit the shore on Saturdays and Sundays. They were also given liberty at New Bedford and Newport during the week that the ship lay at each place.

All those who were deserving, and who desired leave to visit their relatives or friends, were granted it for one week, either at the North or at Hampton Roads.

The general conduct of the cadets has been very good.

The officers charged with the instruction of the cadets have all appeared to take interest in their work, and I believe they have obtained excellent results.

With reference to the discipline and general condition of this vessel, I think I need but call your attention to what you yourself saw during your stay on board, both in the Chesapeake and in Buzzard's Bay, and to add that to Mr. Chester, the executive officer, is entirely due all credit for the same.

The fitting of the ship at Norfolk was all that could be desired.

I am, very respectfully, your obedient servant,

EDWD. TERRY,
Commander, Commanding.

Rear-Admiral C. R. P. RODGERS, U. S. N.,
Superintendent United States Naval Academy.

UNITED STATES STEAMER ALERT, (3d rate,)
UNITED STATES NAVY-YARD, BOSTON, MASS.,
September 6, 1875.

SIR: In obedience to your order, I submit the following detailed report of the practice cruise of the cadet engineers embarked on board this ship:

The seventeen cadets composing the third class of cadet engineers were embarked at the academy on the afternoon of the 22d of June. All their mess arrangements had been previously perfected. N. Lowe, a Japanese student who had joined the ship in Philadelphia, was messed with the cadets, and given the same instructions and privileges as long as he remained on board.

Passed Assistant Engineer Borthwick and Assistant Engineer Rae, detailed as instructors for the cruise, immediately took charge of the instruction of the cadets and divided them into four watches, at stations in the engine and fire rooms. As the class had had no previous instruction in steam-engineering, except in the drawing-room, the instruction was slow at first. Each student has been required to keep a rough note and sketch book in which notes and sketches were made, on the spot, of all points of interest. The rough notes have been carefully rewritten in their journals, and from the rough sketches careful drawings made in their sketch-books. These journals and sketch-books have been inspected after each day's work by the instructors, and weekly by the commanding officer.

The general plan of instruction has been to familiarize the cadets with the construction, care, and management of the engines of this ship. This has been accomplished by requiring them to make sketches of all the steam and water pipes, together with different parts of the engines and pumps. They have been constantly on watch with their instructors whenever the ship has been under steam. Their stations have been frequently changed in order that each might have an opportunity to learn all the duties required of those in care of the engines. One has always been detailed to keep the steam-log.

At each port visited during the cruise, the cadets have visited all the shops and yards of professional interest, in company with their instructors, who guided their observations, explained everything of interest, and indicated what parts of machinery, &c., each was to sketch. These visits to shops on shore have been made during four or five days of the week, each visit being four or five hours long. The remainder of the time has been devoted to writing up their journals and making their drawings. Every Saturday, as far as practicable, has been given for recreation.

We sailed from Annapolis Harbor on June 28, reached Norfolk on the 29th, having been a portion of the previous day in company with the flag-ship Constellation. Sailed from Norfolk on the 29th to rejoin the Constellation. Accompanied the Constellation out to sea, and then received on board the commanding officer of the squadron, Rear-Admiral C. R. P. Rodgers, United States Navy. Returned to Norfolk with the admiral on board. Remained at Norfolk till the evening of July 3. During this time the cadets visited the machine-shops, drawing-room, &c., of the yard. They had an opportunity to examine the compound engines which were being built for the Galena, and to visit the Huron, whose engines are similar to those of this ship. Anchored in Wilmington Creek on the evening of July 4.

Wilmington, Del., July 4–8.—Visited the works of Harlan & Hollingsworth, where every attention was shown the cadets. The steamship

Brashear, the monitor Amphitrite, and the machine-shop, drawing-room, and dry-dock were thoroughly explained. Visited the works of Pusey, Jones & Co., the Lobdell Car-Wheel Works, where everything was explained by Mr. Lobdell and his son; also the works of I. M. Morton & Co. Visited the iron-works of Slidell & Hastings, the machine-shop of Hilles & Jones, and the car-works of the Jackson & Sharp Company. At the latter place Mr. Anchincloss, the vice-president of the company, showed us every attention. Got under way for Edgemoor at high water 8th of July, and came to anchor same evening. Visited here the works of Messrs. Sellers & Garrett. Witnessed the forging of the eyes of the anchor-links of the East River bridge, riveting by hydraulic pressure, and the mechanical puddler, an invention of Mr. Sellers. Left Edgemoor same evening for Chester, and came to anchor soon after.

The yard of John Roach & Co. was visited at this place, where we were kindly received. The engines of the Pacific Mail Steamship Company's steamers City of San Francisco and City of New York were inspected and explained with all particulars. The Ranger, a sister ship of the Alert, was also visited and close attention paid to her machinery. Mr. Woodbridge, the chief draughtsman, kindly placed all the drawings at our disposition, and tracings were made of the most important. Visited the Chester Rolling-Mills, where a Siemans furnace was explained to the cadets. Got under way at 10 a. m. and reached Philadelphia at 11.30 a. m. 13th.

July 14–20.—Visited the works of I. P. Norris & Co. and William Cramp & Son. At the former place were shown everything of interest, and in the drawing-room had the drawings of the Lynn water-works engine explained by Mr. E. D. Leavitt. At the latter place were shown everything in the shops, including a steam-steering gear of very simple and perfect construction. Visited all the shops in the navy-yard, the works of Neafie & Levy, the rolling-mills of Marshall, Ellert & Co., Michell & Verse, and Rowland & Co., and also the saw-works of the American Saw Company, the Baldwin Locomotive Works, and the tool-works of William Sellers & Co., and the Government works at League Island, in all of which places valuable information was obtained. Got under way for New York 20th.

New York, July 21 *to August* 4.—Arrived off navy-yard, New York, July 21. Visited the shops in the yard, the torpedo-boat Intrepid, and the dry-dock pumping-engines. Explained the oil-testing machine. In the draughting-room many tracings were made of the machinery of compound engines. Visited the Chrome Steel Works in Williamsburgh, where we were very kindly received by the officers of the company and the process of manufacture of chrome steel fully explained. Next visited the Hydraulic Works of H. R. Worthington & Co.; were taken through the entire works and explained the process of the construction of a pumping-engine from its inception, through the drawing-room, the pattern-shop, the foundery, the machine-shop, and the erecting-shop, to its completion. The peculiarities of the duplex system were discussed and explained by Mr. Worthington, who personally accompanied the cadets through the works. Visited the Morgan Iron Works, John Roach & Son, where the process of building up and forging large shafts was seen. The engines of the Trenton and of the Pacific Mail steamers being constructed at Chester were seen. Visited the Delamater Iron-Works, where the subject of sweeping up screw-propellers was explained, being the first opportunity presented during the cruise of witnessing the operation. Many sketches were made in the draughting-room at the navy-yard, and all the vessels in ordinary were visited and examined.

July 24.—Rear-Admiral Rodgers came on board and hoisted his flag.

August 4, 5.—Left New York 4th August with Rear-Admiral Rodgers on board; arrived at Narragansett Pier August 5th; left Narragansett Pier same day, and came to anchor off Newport, R. I., at 4.55 p.m., on account of the fog.

Rocky Point, Narragansett Bay, August 6, 7.—August 6, left Newport and came to anchor off Rocky Point at 11.30 a. m., this being the place most convenient to Providence. At 12 m. took steamer for Providence, where we visited the works of the American Screw Company, and were kindly received and shown everything of interest. Visited the Corliss Engine Works, and were kindly received by Mr. Corliss, who took the cadets through the works, explaining everything. Visited the Providence Tool Company's Works, and witnessed the manufacture of the Henry-Martin rifles being made by this company for the Turkish government. Got under way on the evening of the 7th, and steamed to Newport.

Newport, August 8–12.—Visited the torpedo station, where the manufacture of nitro-glycerine, the filling of torpedoes and the different kinds of fuses were explained by Lieut. A. V. Wadhams, of the Alert. Professor Fairner explained the use of all the apparatus in the electrical department with several practical illustrations. Lieutenant Converse explained both the Lay and Ericsson torpedoes.

New Bedford, August 12–18.—Got under way on the morning of the 12th August. Stopped at Narragansett Pier to receive on board Rear-Admiral C. R. P. Rodgers, commanding practice squadron. Fell in with Constellation same afternoon. Rear-Admiral Rodgers shifted his flag to the Constellation. Came to anchor at 4 p. m. in New Bedford Harbor. Visited the Reading Coal Company's wharves. Examined, explained and made sketches of the pockets.

August 1.—First class midshipmen from the Constellation came on board and received instruction in the engineer department. August 16, first class midshipmen came on board again and received instructions during the steam trial. 17th, first class midshipmen came on board and worked ship under sail. At 5 a. m. 18th, got under way for Boston.

Boston, August 19 *to September* 6.—Arrived off navy-yard at 10 a. m., August 19. Visited the works of the South Boston Iron Company, where Mr. Wiard's operations in rifling smooth-bore guns are being conducted. Visited the Norway Iron Works, where spring-steel is manufactured. A Siemens furnace was in operation at these works. Visited the Bay State Iron Company's Works and the works of Harrison, Loring & Co. Visited the Atlantic Works in East Boston, the East Boston Forge Company, where we were kindly received, and witnessed some good forging. Next visited the American Steam-Gauge Company's shops in Boston, where the manufacture, including graduation, of steam and vacuum gauges was fully explained. Visited the machine-shops of both the ordnance and engineer departments in the navy-yard, and all the vessels in ordinary. Instruction in shops concluded September 1. In accordance with instructions, those cadets who could avail themselves of it, were granted leave, with orders to report at the Academy on the 18th of September. The remaining five cadets, with their servants, were sent to the Academy by Baltimore steamer, in charge of Lieutenant Wadhams, on September 4.

In conclusion, I have to report that the conduct of the cadets during the cruise has been excellent. Considering their very scanty professional preparation for the cruise, they have made good use of their opportunities. The Alert has well answered the purpose of the

cruise. The cadets' quarters are large, light, and airy, to which, in part at least, their unbroken good health may be attributed. The ship having the most recent style of engines and boilers, the cadets have had ample opportunities to see their good as well as bad points. It has been my aim to maintain the ship in a good state of order and discipline, to the end that the first impression of the cadets of their life afloat may be correct. In this I have been well supported by the executive officer, Lieutenant-Commander Heyerman. I respectfully recommend that in future the cruise be limited to a smaller number of ports. Workshops constructed for the same kind of work are very much alike, as are also the methods of working. I therefore think that it would be more profitable to the cadets to study into the machinery and methods of one first-class shop, than to visit several of the same kind in the time allowed. My experience enables me to recommend without hesitation the ports of Wilmington, Chester, Philadelphia, and New York.

The shops, founderies, docks, ships, &c., in and about these four ports will furnish a field for study sufficient to occupy the cadets for a much longer time than they have to devote to it. A visit to other ports would only be to repeat what they could see in those mentioned.

Passed Assistant Engineer Borthwick and Assistant Engineer Rae have been careful and zealous in their instruction.

Herewith is a tabulated report of the professional aptitude, attention to duty, deportment, &c., of each cadet.

Respectfully, your obedient servant,

W. T. SAMPSON,
Commander, commanding Practice Steamer Alert.

Rear-Admiral C. R. P. RODGERS, U. S. N.,
Superintendent Naval Academy.

REPORT OF BOARD OF VISITORS.

UNITED STATES NAVAL ACADEMY,
June 21, 1875.

SIR: The undersigned members of the Board of Visitors appointed to attend the annual examination at this Academy, for the year 1875, to witness the examination of the several classes, and to inquire into the state of discipline and general management of the institution, have the honor to make the following report:

The board convened on the morning of June 10th instant, and at once organized, by the election of Commodore Foxhall A. Parker, United States Navy, as president, and Brig. Gen. E. O. C. Ord, United States Army, as vice-president. Assistant Professor W. W. Fay, of the Academy, reported for duty as secretary of the board. All the members of the board were present save Senators Simon Cameron and John B. Gordon, who communicated through Admiral C. R. P. Rodgers, Superintendent of the Academy, their regrets at being unable to attend the meetings of the board at any time during its session.

To facilitate the proper performance of its duties, the board appointed committees from its members; invited the Superintendent to be present, at his pleasure, during its meetings; and, through the Superintendent, requested the heads of the several departments of the Academy to make such written suggestions to the board as their experience would point out as of service to the interests of the Academy.

All necessary assistance and information have been given to the board in the pursuit of its inquiries, both upon the part of the Superintendent and of all the officers of the Academy; and the board takes pleasure in here recording its recognition of the uniform courtesy and kindness which its members have received from every one connected with the Academy with whom they have come in contact.

The board heartily concurs in the opinion of the late board of visitors that the general efficiency of the Academy, its methods of teaching, the high state of its discipline, the advanced moral tone and unvarying culture and gentlemanly bearing of both the officers and cadets, reflect great honor, alike upon its administration, the Navy, and the country.

No general depreciative criticism can be successfully made upon this institution, and anything herein contained looking to a change in the affairs of the Academy should be taken, as the board indeed intends, rather as suggestions still further to widen the area of its efficiency and usefulness, than as hostile criticisms upon its present condition.

With these preliminary observations, the board has the honor to submit its conclusions and recommendations upon such topics as have severally suggested themselves in the course of its official inquiries.

1.—GROUNDS, BUILDINGS, AND SANITARY CONDITION OF THE ACADEMY.

The beauty and high degree of culture and taste shown in the grounds of the Academy are too well known to need comment, and upon this subject the board has only to concur in the recommendation of former boards, that the Government, in order to unite the several properties here, purchase the small tract of land intervening between the Academy grounds and the creek to the north of the same. The desirability of such action is too obvious to need argument for its support.

In general terms the quarters and buildings of the Academy, including the workshops and recitation-rooms, are in good repair, and properly adapted to their several uses; but upon this subject, after careful examination and inquiry, the board has some remarks and suggestions to make deemed important.

After the expiration of the present academic year there will be need of larger workshops for the classes of cadets in the department of steam-engineering, and plans for the necessary change have been made and are now in the possession of the Navy Department.

The building used by the department of physics and chemistry was formerly an old storehouse, and is inadequate to the wants of this very important department.

There should also be increased facilities for work in practical chemistry. The board has observed with surprise that the seats and desks in the recitation-halls are of an antique type, uncomfortable, and not equal even to those now in use in most of the common schools of the country.

New and modern seats and desks would greatly contribute to the comfort and health of the cadets in pursuing their work. Upon the particular topic of quarters, the board observes that the new building is not sufficiently commodious to accommodate all the cadets. The division of quarters, as it now exists, requires a double organization of guards, watchmen, &c., and two formations for every duty of the battalion, thus increasing expense, and tending to mar the efficiency of discipline.

The present arrangement has the additional disadvantage of causing the cadets of the fourth class to be quartered together, and thus to lose the influence of those of the other more advanced classes.

The board recommends that the new building should be sufficiently enlarged to quarter the entire body of cadets. The ventilation of the new quarters is defective, especially that of the lower halls, in which in winter, and in inclement weather, it is necessary to make the sectional formations.

The room for drawing, at the top of this building, is almost entirely without ventilation. The basement of the same building is now used in part for a laundry. This increases the danger of fire, and occupies room which might be used to advantage for other purposes necessary to be pursued in the building. The board would recommend, as important, the provision of a separate building for laundry.

The old quarters now occupied by the fourth class are much out of repair, and with little expense in addition to the repairs essential, could probably be made fit for other purposes of the academy.

The present armory is a mere shell, and inadequate to the purposes for which it is used.

The various repairs and improvements herein recommended will, of course, require the action of Congress, and the board, through your Department, desires to recommend such legislation in the premises as the wisdom of that body may suggest.

The board would here remark that, while making its inspection of the new quarters, it carefully examined into the kind, quality, and cooking of the food furnished the cadets, and is clear in its opinion that in all these respects the efficient management of Colonel Swann, the commissary of the academy, has left nothing to be desired; but that this department of the administration of affairs is most successfully served. The sanitary condition of the academy is good, the hospital having no inmates, and the general health of the cadets is excellent.

The board suppose that no hardier or more healthy-looking body of young men than that of the cadets of this academy can be found in the country.

2.—ADMINISTRATION AND POLICE.

Under this head the board have only to express the pleasure it has experienced in observing the high state of discipline preserved by this academy under the intelligent management of its distinguished superintendent, Rear Admiral C. R. P. Rodgers, and his able corps of assistants; a discipline, in the opinion of the board, attained, not by the rigorous exercise of authority alone, but by kindness united with firmness. In this respect the academy has not only stood fast upon the ancient ways, but has perhaps enlarged and improved them.

A pleasing phase of the life of the cadets here, as observed by the board, is found in the advantages of social improvements extended to the cadets in visiting the families of their instructors, without the formality of special invitations or permission. The importance of such opportunity, if properly used, in forming the manners and character of the young officers cannot be too highly estimated.

3.—FINANCE AND LIBRARY.

With regard to the method of keeping the accounts and furnishing the supplies of whatever nature necessary for the cadets, both as to the quality of the goods and the cost at which they are sold, the admirable system in use at the academy seems to leave nothing to be desired.

The library is large, well selected and arranged, and easy of access to all who may desire to avail themselves of its use. Such appropriations as are necessary should be annually made for the purchase of additional books.

4.—STUDIES AND PRACTICAL EXERCISES.

The board as a whole, or through its committees, has attended all the oral examinations; has inspected many of the written papers of the cadets; and has witnessed, with much interest, the drills in the handling of sails and spars; the evolutions of the fleet of boats; the drill at the great guns and target practice; in boarding and repelling boarders; the maneuvers of the battalion as infantry, and with the howitzer batteries; also an exercise in signaling. Its observation of these things has fully proved to the satisfaction of the board that the system of teaching pursued at the academy, combining theory and instruction by the professors and from books, with constant practical work in the various arts and sciences taught, is fitted to achieve the highest results and deserves especial commendation.

The cadets in their examination showed that they were not taught by rote simply, but had thoroughly learned the principles underlying the several departments and branches of their studies; and the promptness and skill, and thoroughness with which they went through the difficult drills spoken of, called forth the constant admiration of the board. The results obtained by the methods of teaching here employed were thus crystallized and plainly seen, and in the opinion of the board, bear sure witness to the success of the Academy as a training-school for well instructed naval officers.

MISCELLANEOUS OBSERVATIONS.

In rendering their report of the result of their inspection of the administration and affairs of the Naval academy, the board desires to present for the information of your Department and of Congress some additional suggestions which they deserve worthy of consideration.

The course of study now pursued at the academy seems to be crowded, so that some things essential to a well-rounded education are necessarily omitted therefrom, solely for want of time. For instance, no formal instruction is given in ethics, and the courses in English composition, rhetoric, history, and literature, and in constitutional law is very limited No instruction is given in the methods, jurisdiction, or procedure of naval commissions of inquiry or courts-martial. A less crowded course would also admit of such general instruction, by lecture and otherwise, in natural history, geology, and botany, as would prepare officers of the Navy to observe and collect valuable information upon these subjects from all parts of the world.

The course in mathematics during the first year would seem to be very severe, and the necessity for more thorough preparatory training, or the introduction of some elementary instruction in this branch, is obvious.

It is a matter of deep regret that so large a number of those appointed to the academy fail either in passing the preliminary examination, or during the course of the first year. Out of one hundred and five candidates who presented themselves for admission to the academy as cadet-midshipmen in the year 1874, fifty-two were rejected at the preliminary examination, and, of thirty who have been examined this year, five have failed upon the physical examination alone.

The mortification and expense involved by rejection—for the last-named cause may well be avoided if the candidates were subjected to a thorough physical examination by competent surgeons before leaving their homes—and, in the opinion of the board, the evil of rejection for other causes would be much lessened if, by law, appointments to the academy were required to be made one year in advance, and the candi-

dates for admission to the academy, after passing the physical examination, and before their further examination at the expense of the Government, were authorized to receive instruction and make recitations in the rudimentary mathematics in which they were to be examined, for a limited period, before such examination, in order to clearly develop their aptitude and capacity for the course of study to be pursued in the academy. It is clear, however, that this subject should receive the careful consideration of Congress, and to that body this board, having closed its duties, remits it in the confident hope that such legislation may be had as will hereafter still further promote and develop the efficiency of the Navy of the United States, whose gallantry, culture, and discipline have, in the past, illumined the name of the Republic upon every sea where its flag has floated.

All of which is respectfully submitted.

FOXHALL A. PARKER,
Commodore and President of the Board.
E. O. C. ORD,
Brig. Gen. U. S. A., Vice President of the Board.
O. H. TIFFANY, D. D., Illinois.
WM. E. POTTER, New Jersey.
ALEX. M. GOW, Indiana,
Supt. of Public Schools, Evansville.
E. S. CARR, Oakland, Cal.
JNO. G. JAMES, Texas,
Supt. Tex. Mil. Inst., Austin.
ROBT. PETTIT, U. S. N.,
Pay Director.
ALEXANDER HENDERSON,
Chief Engineer, U. S. Navy.
GEO. E. BELKNAP, U. S. N.,
Captain.

Attest:
W. W. FAY,
Assistant Professor, Secretary Board of Visitors.

REPORT ON USE OF TOBACCO BY THE CADETS.

UNITED STATES NAVAL ACADEMY,
December 2, 1875.

GENTLEMEN: The Regulations of the Naval Academy prohibit the use of tobacco by the cadets, as a sanitary precaution, and as calculated to lessen their capacity for study. I am having much difficulty in enforcing this regulation, and if it be unnecessary I should be glad to know it.

You are therefore appointed a board to carefully consider this subject, and to give me your views thereon.

Very respectfully,

C. R. P. RODGERS,
Rear-Admiral, Superintendent.

Medical Inspector A. L. GIHON,
Medical Inspector A. C. GORGAS,
Surgeon G. A. BRIGHT,
United States Naval Academy.

MEDICAL DEPARTMENT, U. S. NAVAL ACADEMY,
Annapolis, Md., December 3, 1875.

SIR: The board appointed by your order of the 2d instant, to consider the subject of the use of tobacco by the cadets at the academy, beg to report as follows:

The impropriety of this practice has been represented by the various medical officers successively attached to this academy. As early as March 22, 1861, Dr. Palmer wrote to the Superintendent with respect to a case of "nausea and nervous derangement, rendering him (an acting midshipman) unfit for study or recreation, of which the cause was the confessed use of tobacco. It is not my design, though it might be my duty, to make this a report of infraction of discipline, but only to offer an authentic example of a practice prevalent to an alarming extent in the academy. If one of the most mature and robust of our young men is obliged to confess himself unable to pursue his studies in consequence of the use of tobacco, how much more actively must the same poison operate upon many, who are mere boys, adopting this deleterious habit from the examples of their seniors!

"There is good reason to believe that a large number of vague complaints, for which midshipmen report to the surgeon, must be attributed solely to the use of tobacco. I know of no other mode of accounting for the malaise, want of sleep, dizziness, headache, nausea, &c., of which I receive frequent representations; and, finally, it is my deliberate opinion that the unsatisfactory recitations, and consequent failures at examinations, so injurious to the interest of this establishment, are to be attributed, in a great measure, to nervous derangement, caused by the common use of tobacco by the students. It becomes my duty to recommend some stringent measures to correct this practice."

Experience, since that time, has been confirmatory of the opinion here so ably set forth by Surgeon-General Palmer.

Whatever arguments may be adduced in favor of the rational and temperate use of tobacco by adults, no doubt exists among medical men as to its injurious effects upon the growing organisms and mental powers of the young. Functional derangement of the digestive, circulatory, and nervous systems manifest themselves in the form of headaches, confusion of intellect, loss of memory, impaired power of attention, lassitude, indisposition to muscular effort, nausea, want of appetite, dyspepsia, palpitation, tremulousness, disturbed sleep, impaired vision, &c., any one of which materially lessens the capacity for study and application, and most of which are daily subjects of complaint to the medical officers, and form so large a proportion of the sick-list that the extent of surreptitious indulgence in smoking and chewing may be inferred.

The recent experiment of permitting smoking at the academy has satisfactorily demonstrated the especial impropriety of the practice at an institution of this character.

The further evil of moral contamination, from the necessarily unrestrained intercourse and language of the smoking-room, was superadded to physical and mental impairment. This apartment became the chosen resort of the leisure hours, its stifling atmosphere injuring health all the more seriously from the intensified form in which the tobacco-fumes were offered for absorption into the system, while outdoor exercise and recreation were proportionably neglected.

The board have confined themselves in this report to the consideration of the effects of the use of tobacco upon the cadets of the academy. For this reason no mention has been made of certain organic diseases

attributed to the prolonged use of tobacco, or of the serious nervous disorders which sometimes follow its excessive use.

In most cases the first and early attempts to smoke or chew produce nausea, vomiting, tremors and prostration. These symptoms lessen in severity gradually, as the practice is continued, and usually it is only after protracted habit that perfect tolerance is secured. Should tobacco be allowed the cadets, a large number of beginners would be subjected to this experience, a condition of things which would militate against the good effects of the sanitary regulations of the school, which have in all other respects maintained so high a standing of health.

The board are of opinion, therefore, that the regulations against the use of tobacco, in any form, cannot be too stringent; and further, that, while smoking should be wholly interdicted, especial care should be exercised to prevent the substitution of chewing, the more deleterious practice.

Very respectfully, your obedient servant,

A. L. GIHON,
Medical Inspector, United States Navy.
A. C. GORGAS,
Medical Inspector.
GEO. A. BRIGHT,
Surgeon.

Rear-Admiral C. R. P. RODGERS, U. S. N.,
Superintendent United States Naval Academy.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1877, by the Naval Academy.

Detailed objects of expenditure, and explanation.	Estimated amount which will be required for each detailed object of expenditure.
Pay Naval Academy:	
One professor of drawing, (head of department)	$2,500 00
One professor of English studies, history, and law, (head of department)	2,500 00
Three professors, viz: One of mathematics, one of chemistry, and one of French, (assistants,) at $2,200 each	6,600 00
Twelve assistant professors, viz: Four of French, one of Spanish, three of English studies, history, and law; one of mathematics, one of astronomy, and two of drawing, at $1,800 each	21,600 00
Sword-master, at $1,500, and two assistants, at $1,000 each	3,500 00
Boxing-master and gymnast	1,200 00
Assistant librarian	1,400 00
Three clerks to superintendent, at $1,200, $1,000, and $800	3,000 00
One clerk to commandant of cadets	1,200 00
One clerk to paymaster	1,000 00
One apothecary	750 00
One commissary, at $288; one cook, at $325.50; and messenger to superintendent, at $600	1,213 50
One armorer, at $529.50; gunner's mate, at $469.50; and quarter-gunner, at $409.50	1,408 50

Estimates of appropriations required, &c.—Continued.

Detailed objects of expenditure, and explanation.	Estimated amount which will be required for each detailed object of expenditure.
One cockswain, at $469.50; and three seamen in department of seamenship, at $349.50 each	$1,518 00
One band-master, at $528; and eighteen first-class musicians, at $348 each	6,792 00
Seven second-class musicians, at $300 each; two drummers and one fifer, (first class,) at $348 each	3,144 00
	59,326 00
Amount appropriated under this head, "Pay of professors and others," for the year ending June 30, 1876	59,126 00
Excess	200 00
NOTE.—This excess is occasioned by an increase of pay of two hundred dollars per annum, recommended for the clerk to the commandant of cadets.	
Pay of watchmen and others:	
Captain of the watch, at $2.50 per diem	$912 50
Four watchmen, at $2.25 per diem each	3,285 00
Foreman of the gas and steam-heating works of the academy, at $5 per diem	1,825 00
Ten attendants at gas and steam-heating works: one at $3.50, one at $3, and eight at $2.50 per diem each	9,672 00
One assistant to foreman of gas and steam-heating works, at $1 per day	365 00
Three joiners, two painters, and two masons, at $3.50 per diem each	8,942 50
One tinner, one gas-fitter, and one blacksmith, at $3.50 per diem each	3,832 50
	28,834 50
Amount appropriated for the year ending June 30, 1876	28,469 50
Excess	365 00
NOTE.—This excess is occasioned by the recommendation of an assistant to the foreman of the gas and steam-heating works, at $1 per day.	
Pay of mechanics and others:	
One mechanic at workshop, at $2.25 per diem	$821 25
One master-laborer, to keep public grounds in order, at $2.28 per diem	832 20
Fourteen laborers, to assist in same, three at $2 and eleven at $1.75 per diem each	9,216 25
One laborer, to superintend quarters of cadets, public grounds, &c., at $2.28 per diem	832 20
Four attendants, one at chapel, and three at recitation-rooms, library, and offices, at $20 per month each	960 00
Twenty servants, to keep in order and attend to cadet quarters, public buildings, &c., at $20 per month each	4,800 00
	17,461 90
Appropriated for the year ending June 30, 1876	17,461 90
Pay in department of steam-enginery:	
One machinist, at $3.50 per diem	1,277 50
One machinist, at $3 per diem	1,095 00
One blacksmith, at $3.50 per diem	1,277 50
One boiler-maker, at $3.50 per diem	1,277 50
One pattern-maker, at 3.50 per diem	1,277 50
One molder, at $3.50 per diem	1,277 50
Two laborers, at $1.75 per diem each	1,277 50
	8,760 00

Estimates of appropriations required, &c.—Continued.

Detailed objects of expenditure, and explanation.	Estimated amount which will be required for each detailed object of expenditure.
Repairs and improvements:	
For the necessary repairs of public buildings, pavements, wharves, and walls inclosing the grounds of the academy, for improvements of the same, and for furniture, fixtures, &c	$24,000 00
For heating and lighting:	
For fuel for heating and lighting the academy and school-ships	15,000 00
Appropriated for the year ending June 30, 1876	15,000 00
General maintenance Naval Academy:	
For the purchase of books for the library	1,500 00
For stationery, blank-books, models, maps, &c., and for text-books for the use of instructors	2,000 00
For the expenses of the Board of Visitors	2,600 00
For the purchase of chemicals, apparatus, and instruments in the department of physics and chemistry, and for repairs of the same	2,500 00
For the purchase of gas and steam-machinery, steam-pipe and fixtures, rent of buildings for use of the academy, freight, cartage, water, music, musical and astronomical instruments, uniforms for the bandsmen, telegraphing, and for the current expenses and repairs of all kinds, and for incidental labor and expenses, not applicable to any other appropriation	34,600 00
For stores in the department of steam-enginery	800 00
For materials for repairs in steam-machinery	1,000 00
	45,000 00
Amount appropriated for the year ending June 30, 1876	41,600 00
Excess	3,400 00
NOTE.—This amount is indispensably necessary; a lesser sum is deemed insufficient for the purpose.	
RECAPITULATION.	
Pay of professors and others	59,326 00
Pay of watchmen and others	28,834 50
Pay of mechanics and others	17,461 90
Pay in department of steam-enginery	8,760 00
Repairs and improvements	24,000 00
Heating and lighting	15,000 00
General maintenance	45,000 00
Total amount estimated for	198,382 40
Appropriated for year ending June 30, 1876	194,417 40
Excess	3,965 00

Respectfully submitted.

C. R. P. RODGERS,
Rear-Admiral, Superintendent.

Hon. GEORGE M. ROBESON,
Secretary of the Navy.

No. 3.

BUREAU OF YARDS AND DOCKS.

BUREAU OF YARDS AND DOCKS, NAVY DEPARTMENT,
Washington, D. C., September 29, 1875.

SIR: I have the honor to submit the annual report of the Bureau of Yards and Docks for the fiscal year ending June 30, 1875, together with estimates for improvements and repairs for the fiscal year ending June 30, 1877.

KITTERY NAVY-YARD.

At this navy-yard little could be done beyond making the repairs necessary to prevent the dock and buildings from falling into decay. The allotment to the yard has been economically and satisfactorily expended.

BOSTON NAVY-YARD.

The buildings and docks at this yard have been repaired so far as the moderate allotment would permit. Your attention is respectfully called to the estimates for a boundary-wall, a necessary protection against fire, for a wet timber-basin, and for workshops for this Bureau—improvements much needed.

NEW LONDON NAVAL STATION.

A board of civil engineers has prepared an elaborate plan for a navy-yard at this site. Should it be contemplated to press the work at this station to completion, large appropriations will be necessary. The work already completed has been well and economically done. A second storehouse has been finished, an inexpensive dwelling-house for the civil engineer erected, and the wharf-facilities have been enlarged and improved. Grading has been carried on with reasonable speed and economy.

NEW YORK NAVY-YARD.

I beg leave to renew the recommendation that this important navy-yard be preserved in its territorial integrity. In the near future, every available foot of ground within its walls will be needed for wet-docks, timber-sheds, workshops, and other public buildings. The importance of a liberal appropriation for the improvement of the cob-dock is made more manifest each year.

PHILADELPHIA NAVY-YARD.

The work of transferring the plant from this navy-yard to League Island has been carried on as rapidly as circumstances would permit.

LEAGUE ISLAND.

At this naval station the iron-plating shop has been finished, the foundations for an extensive steam-engineering building have been laid, and the brick-work of the walls commenced. Owing to the small appropriation for this station, little "filling-in" could be accomplished.

It is hoped that, with the fund inuring from the sale of the Philadelphia navy-yard, greater progress may be made during the ensuing year.

A repairing-basin, in which vessels may lie during the winter, protected from the running ice of the river, and a substantial wharf, extending into deep water, are of prime necessity. It is possible to cover the island with workshops, but League Island as a building and repairing yard will be useless to the nation until a proper wharf, with facilities for lifting heavy weights, and a repairing-basin for the purpose indicated, shall have been completed.

The whole proceeds of the sale of the Philadelphia yard should, in my judgment, be made immediately available for this great undertaking. Crib-work, granite-laying, and excavations, once commenced, should, as a mere matter of economy, be as rapidly as possible carried to completion.

WASHINGTON NAVY-YARD.

The small amount allotted to this yard during the past year under the appropriation "repairs and preservation" has been judiciously expended, but was not sufficient to make all the repairs to the various buildings and wharves that a due regard to economy would dictate. The law of last Congress prohibited the expenditure of any portion of the appropriation for "repairs and preservation," 1875–'76, at this yard, and, as a consequence, a larger sum will be required to meet the expense for repairs during the next year.

NORFOLK NAVY-YARD.

Repairs have been gradually and economically made at this yard, which, from its geographical position and natural advantages, is an important naval station.

PENSACOLA NAVY-YARD.

Repairs to the dry-dock, basin, and workshops have been made at this yard, and a number of wooden buildings, used as hospitals and infected with fever from the epidemic of last year, have been torn down and burned. By the intelligent efforts of the present commandant of this station, it has been preserved from the recurrence of the epidemic during the past summer.

Two sections of the iron dry-dock will probably be completed within the next six months.

MARE ISLAND NAVY-YARD.

From a personal inspection of the Mare Island navy-yard, I am able to state that the work upon the large granite dry-dock is progressing satisfactorily, and that the yard itself is in excellent condition. An appropriation for the commencement of a quay-wall along the face of the yard is strongly recommended, and is becoming a necessity, in order to preserve the channel from gradually filling up, and to moderate the expense of constant dredging. The best means of supplying this navy-yard with water are under consideration; the report of the commandant upon the subject is daily expected.

I beg to recommend as a measure of undoubted economy that an appropriation be asked from Congress for the building of three inexpensive wooden workshops, and a landing-wharf, at some point near Port Royal, S. C., where a suitable site can be obtained. When our vessels are driven from Key West by yellow fever, Port Royal is the nearest and safest harbor of refuge. With workshops and the necessary tools, the artisans from the vessels of the squadron should be able to make

all minor necessary repairs, all repairs which do not involve the necessity of docking the vessel; and the great expense of sending the vessels of the North Atlantic squadron to a dock-yard, would, in a measure, be avoided.

I entirely concur in the recommendation of my predecessor relative to the pressing need of a proper naval reformatory prison, to be located at one of our navy-yards; plans and specifications are already in possession of the Bureau, and I cannot too strongly urge the necessity of an appropriation for this humane reformatory measure.

I beg leave to state that, with the limited appropriations of the past two years, not only is it impracticable to improve the navy-yards and stations, but the actual necessary repairs to dry-docks, buildings, and workshops, railways and wharves, cannot be substantially accomplished. Temporarily patching up public works, when radical repairs are needed, is unwise economy, and I earnestly call your attention to the estimates submitted for placing the navy-yards in thorough working condition.

Report of expenditures at navy-yards, stations, and Naval Asylum for fiscal year ending June 30, 1875.

Yards and stations.	Appropriations.				
	Navy-yard or station.	General maintenance.	Civil establishment.	Contingent.	Totals.
Portsmouth, N. H.	$24,779 71	$70,907 40	$4,839 49	.....	$100,526 60
Boston, Mass.	115,078 36	110,303 09	6,458 85	$2,500 00	234,340 30
New London, Conn.	33,338 70	8,665 26	.....	.....	42,003 96
New York, N. Y.	92,638 02	140,321 18	6,661 47	.....	239,620 67
Philadelphia, Pa	25,952 91	46,337 77	6,449 41	7,962 68	86,702 77
League Island, Pa.	360,386 62	54,753 40	2,748 40	14,850 00	432,738 42
Washington, D. C.	30,168 93	82,229 21	5,070 12	3,291 95	120,760 21
Norfolk, Va	117,726 99	76,543 26	5,109 79	4,236 89	203,616 93
Pensacola, Fla.	79,361 49	53,750 30	2,007 50	5,618 15	140,737 44
Mare Island, Cal	307,876 24	102,387 85	6,247 05	.....	416,511 14
Sackett's Harbor, N. Y.	.....	1,015 72	.....	.....	1,015 72
New Orleans, La	.....	605 00	.....	.....	605 00
Key West, Fla	.....	170 00	.....	697 00	867 00
Naval Asylum, Pa.	69,970 35	.....	.....	.....	69,970 35
Total	1,257,278 32	747,989 44	45,592 08	39,156 67	2,090,016 51

Accompanying this report is an abstract of offers for supplies received for furnishing articles coming under the cognizance of the Bureau of Yards and Docks, made in conformity to the act of Congress approved March 3, 1843.

The following estimates for the fiscal year ending 30th June, 1877, are respectfully submitted:

Sheet No. 1.—For support of Bureau of Yards and Docks	$15,280
Sheet No. 2.—General maintenance of yards and stations and contingent	910,000
Sheet No. 3.—Support of Naval Asylum	58,177
Sheet No. 4.—Repairs and preservation	500,000
Sheet No. 5.—Improvements at navy-yards	1,225,000
Total estimates of Yards and Docks	2,708,457

I am, sir, very respectfully, your obedient servant,

J. C. HOWELL,
Chief of Bureau.

Hon. GEORGE M. ROBESON,
Secretary of the Navy.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1877, by the Bureau of Yards and Docks, Navy Department.

Detailed objects of expenditure, and explanations.		Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1876.
SALARIES.			
Chief clerk, per act of July 5, 1862		$1,800 00	.....
Draughtsman and clerk, per act of March 2, 1867		1,800 00	.....
One clerk of class four, per act of March 2, 1867		1,800 00	.....
Two clerks of class three, per act of March 2, 1867		3,200 00	.....
One clerk of class two, per act of March 2, 1867		1,400 00	.....
One clerk of class one, per act of March 2, 1867		1,200 00	.....
One messenger, per acts of July 5, 1862, and July 12, 1870		840 00	.....
Two laborers, at $720 each, per acts of July 5, 1862, and July 12, 1870		1,440 00	.....
CONTINGENT EXPENSES.		13,480 00	$12,760 00
Stationery, books, plans, drawings, incidental labor, and miscellaneous items, (appropriated)		1,800 00	1,800 00
FOR GENERAL MAINTENANCE OF YARDS AND DOCKS.			
For general maintenance of yards and docks; freights and transportation of materials and stores; printing, stationery, and advertising, including the commandant's office; books, maps, and models and drawings; purchase and repair of fire-engines; machinery, and patent-right to use the same; repairs of steam-engines and attendance on the same; purchase and maintenance of oxen, horses, and driving teams; carts and timber-wheels for navy-yard purposes; tools and repairs of the same; postage on letters and other mailable matter on public service, and telegrams; furniture for Government houses and offices in navy-yards; coal and other fuel; candles, oil, and gas; cleaning and clearing up yards, and care of public buildings; attendance on fires, lights, fire-engines and apparatus; incidental labor at navy-yards; water-tax; tolls and ferriages; pay of watchmen in navy-yards; awnings and packing-boxes for Bureau of Yards and Docks purposes		860,000 00	760,000 00
CONTINGENT.			
For contingent expenses that may arise at navy-yards and stations		50,000 00	40,000 00
NAVAL ASYLUM, PHILADELPHIA, PA.			
Superintendent	$600 00		
Steward	480 00		
Matron	360 00		
Cook	240 00		
Assistant cook	168 00		
Chief laundress	192 00		
Three laundresses, at $168 each	504 00		
Eight scrubbers and waiters, at $168 each	1,344 00		
Six laborers, at $240 each	1,440 00		
Stable-keeper and driver	360 00		
Master-at-arms	480 00		
Corporal	300 00		
Barber	360 00		
Carpenter	845 00		
		7,673 00	7,673 00
For water-rent and gas	1,900 00		
For cemetery, head-stones, digging graves, &c	450 00		
For repairs of buildings and improving grounds	2,000 00		
For ice and car-tickets	450 00		
For furniture and repairs of same	500 00		
For support of beneficiaries	45,204 00		
		50,504 00	45,600 00
		58,177 00	53,273 00

NOTE.—The expenses of the Naval Asylum to be paid from income of the Navy pension-fund, in compliance with provisions of act of March 1, 1869, 15 Statutes, 277.

ABSTRACT OF OFFERS FOR SUPPLIES RECEIVED FOR FURNISHING ARTICLES COMING UNDER THE COGNIZANCE OF THE BUREAU OF YARDS AND DOCKS, MADE IN CONFORMITY TO THE ACT OF CONGRESS APPROVED MARCH 3, 1843.

Offers for material for the navy-yard at League Island, Pa., under advertisement dated April 8, 1875.

Class No. 1. Granite:

Thos. H. Kemble, prest..	$6,647 25
Gilman & Cheney.....	6,118 53
H. Barker & Brothers...	9,835 95
Bodwell Granite Co.....	7,214 49
James D. Leary.....	9,400 00
Philip Doughty.....	7,230 00
Austin P. Brown.....	9,334 91
Mark & St. John	*4,913 43
E. C. Sargent.....	6,985 00

Class No. 2. Slate:

Wilson & Miller	$550 00
D. C. Pratt, (blue)	†550 00
D. C. Pratt, (purple)	625 00

Class No. 3. Iron beams:

Potter & Hoffman	$18,913 56
Austin P. Brown.....	19,101 43
James Symington.....	18,612 78
Carnegie Bros. & Co	19,068 09
Joseph L. Savage	20,668 21
David Babcock & Co....	*18,534 39
A. R. Whitney & Bro ...	18,612 78
Phœnix Iron Company ..	18,913 57

Class No. 4. Bricks:

Austin P. Brown.....	*15,893 00
Benjamin Allen.....	16,752 00

Opened May 6, 1875, in presence of—
J. C. HOWELL, *Chief of Bureau.*
W. P. S. SANGER, *Civil Engineer of Bureau.*
A. E. MERRITT, *Chief Clerk of Bureau.*
D. J. PARTELLO, *Clerk.*

Offers for supplies for navy-yard at Kittery, Me., under advertisement dated June 9, 1875.

Class No. 20. Hay and straw:

George H. Hayes.....	*$1,476 75

Class No. 27. Anthracite coal:

James Symington.....	$5,160 00
C. E. Walker.....	*4,938 00
David Babcock & Co....	4,948 50
J. W. Deering	5,227 50

Class No. 27. Anthracite coal —Continued.

Meeker & Dean.....	$4,950 00
Samuel G. French	4,957 50

Class No. 29. Bituminous coal:

C. E. Walker	*140 00

Offers for supplies for the navy-yard at Boston, Mass., under advertisement dated June 9, 1875.

Class No. 20. Hay and straw:

John Trickey.....	‡$2,700 00
Scott & Bridge	*2,730 00

Class No. 27. Anthracite coal:

James Symington.....	5,576 25
David Babcock & Co....	*5,287 50
Meeker & Dean.....	5,290 50

Class No. 27. Anthracite coal —Continued.

Samuel G. French	$5,325 00

Class No. 29. Cumberland coal:

David Babcock & Co....	*173 75

* Accepted. † By lot. ‡ Informal.

Offers for supplies for the navy-yard at Brooklyn, N. Y., under advertisement dated June 9, 1875.

Class No. 20. Hay and straw:	
Edward R. Shipman	*$2,100 00
Class No. 27. Anthracite coal:	
James Symington	$4,601 00
David Babcock & Co	4,598 00
Samuel G. French	*4,470 00

Offers for supplies for the navy-yard at Philadelphia, Pa., under advertisement dated June 9, 1875.

Class No. 20. Hay and straw:	
Paul J. Field	†$1,008 00

Offers for supplies for the navy-yard at League Island, Pa., under advertisement dated June 9, 1875.

Class No. 20. Hay and straw:	
Paul J. Field	†$470 40
Class No. 27. Anthracite coal:	
James Symington	*1,597 25
Class No. 27. Anthracite coal—Continued:	
Samuel G. French	$1,622 50
Class No. 29. Cumberland coal:	
No offers made.	

Offers for supplies for the navy-yard at Washington, D. C., under advertisement dated June 9, 1875.

Class No. 20. Hay and straw:	
Solon Fisher	*$944 00
C. T. Yoder	1,012 00
Class No. 29. Cumberland coal:	
Joseph L. Savage	1,760 00
Class No. 29. Cumberland coal—Continued:	
Consolidation Coal Company	$1,660 00
James Symington	1,940 00
A. M. Brandt	*1,640 00
C T. Yoder	1,732 00

Offers for supplies for the navy yard at Norfolk, Va., under advertisement dated June 9, 1875.

Class No. 20. Hay and straw:	
C. T. Yoder	$2,396 25
Peters Brothers	*2,132 50
A. A. McCullough	2,308 00
Class No. 27. Anthracite coal:	
James Symington	907 20
David Babcock & Co	1,064 00
Samuel G. French	889 00
C. T. Yoder	994 00
Peters Brothers	*847 00
Class No. 27. Anthracite coal—Continued:	
A. A. McCullough	896 00
Class No. 29. Cumberland coal:	
Consolidation Coal Company	1,645 00
James Symington	1,960 00
A. M. Brandt	2,068 50
C. T. Yoder	1,830 50
Peters Brothers	*1,638 00
A. A. McCullough	‡1,610 00

*Accepted. †Exorbitant. ‡Received too late.

Offers for supplies for the navy-yard at Mare Island, Cal., under advertisement dated June 9, 1875.

Class No. 27. Anthracite coal:

James Symington	$2,390 00
David Babcock & Co	2,440 00
Samuel G. French	*2,220 00
Farwell & Co	2,500 00
James McCudden	2,400 00

Class No. 29. Cumberland coal:

David Babcock & Co	$1,390 00
Samuel G. French	1,245 00
Farwell & Co	*1,200 00
James McCudden	1,350 00

Opened July 7, 1875, in presence of—
J. C. HOWELL, *Chief of Bureau.*
W. P. S. SANGER, *Civil Engineer of Bureau.*
D. J. PARTELLO, *Clerk.*

Offers for supplies for the Naval Asylum at Philadelphia, under advertisement dated July 12, 1875.

Class No. 1. Clothing:

Jacob Reed	$7,040 03
Wanamaker & Brown	*5,994 16

Class No. 2. Boots and shoes:

J. Cotter & Son	$3,162 50
Smith & Buckley	3,175 00
John Keenan	3,037 50
William McKnight	*2,936 50

Class No. 3. Provisions:

Hugh McNeile	*$12,153 75
H. H. Corney	12,181 45
G. & A. Schiedt	13,868 80

Class No. 4. Groceries:

Burns & Smucker	$8,531 05
Charles H. Kirk	8,762 77
E. J. Crippen & Co	8,652 50
Anderson & Dunlap	8,005 50
Hill & Brother	*7,846 60

Class No. 5. Dry goods:

Sheppard, Anison & Sheppard	$453 00
George Milliken & Son	*422 00
Crippen & Co	541 00
Sharpless & Sons	474 55

Class No. 6. Bread:

Lewis P. Stone	$2,158 56
James Park	*1,764 43
Charles McIntyre	2,262 37
Thomas McConnell	1,893 00
John McIlvain	2,037 50
John Junker	4,000 00

Class No. 7. Tobacco:

Paul J. Field	$1,098 00
Burns & Smucker	1,040 00
Charles H. Kirk	*1,020 00
E. J. Crippen & Co	1,160 00
George Milliken & Son	1,040 00
Hill & Brother	1,160 00

Class No. 8. Coal and wood:

W. F. Moodie	$2,531 50
Campbell, Tucker & Co	*2,509 50
Robert M. Chester	2,677 50

Class No. 9. Paints, oil, and glass:

J. B. Shannon	*666 55

Class No. 11. Lumber:

Harbert, Russell & Co	$413 75
Maule, Brothers & Co	410 00
J. W. Gaskill & Sons	*400 20

Class No. 13. Provender:

Paul J. Field	$328 00
Thomas Shaw	*300 50

Class No. 14. Miscellaneous:

Paul J. Field	$327 35
E. J. Crippen & Co	383 00
J. B. Shannon	*210 66
Hill & Brother	246 26

Class No. 15. Hardware:

Paul J. Field	$254 72
J. B. Shannon	*199 40

Opened August 9, 1875, in presence of—
A. W. RUSSELL, *Pay-Inspector United States Navy.*
H. B. HOLMES, *Secretary to Governor of Naval Asylum.*

Awards made to the lowest bidders by Acting Chief of the Bureau of Yards and Docks, Commander George C. Remey, United States Navy.

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*Accepted.

No. 4.

BUREAU OF NAVIGATION.

NAVY DEPARTMENT, BUREAU OF NAVIGATION,
October 26, 1875.

SIR: I have the honor to submit the following report of the Bureau of Navigation for the past year, together with estimates for its support, and for the expenditures that will probably be required in that division of the naval service committed to its immediate charge for the fiscal year ending June 30, 1877. Included in this report, and transmitted herewith, are the reports and estimates of the several offices under its cognizance.

NAVIGATION.

Compasses and compass-stations.—For years past, this Bureau has promoted, as far as possible, the construction of marine compasses known as "liquid;" it is supposed that those now in use are inferior to none; for this purpose a compass-observatory has been built, and supplied with the proper testing-instruments, at Brookline, near the manufactory which supplies compasses for the Navy.

The use of compass-stations, designed for making tables of local deviation for our vessels-of-war, is supposed to be objectionable, rather than advantageous; the operation of making the tables is usually slow, wanting in accuracy, and, when completed, leaves the supposition that, without compass-stations, deviation-tables could not well be made.

Publications on this subject have been made, tables calculated, &c., and there is no reason why every vessel-of-war should not make a new table whenever a considerable geographical change has been made.

The appended report of Prof. B. F. Greene, United States Navy, who is charged with the superintendence of Navy compasses, treats of this important subject more fully.

During the past year, a considerable number of old dry compasses were disposed of at public auction, as no longer suitable for service; and the stock of Navy liquid compasses has been augmented by the purchase of a number of the most improved pattern.

In the allowance of other nautical instruments, no change has taken place, except that now a Laurent's night-octant is issued to every vessel fitting for sea, which instrument has proved useful.

Nautical charts and books.—The supply of these indispensable aids to navigation is being increased as the operations of the Hydrographic Office proceed in their preparation. Most of the charts and sailing-directions now used in the Navy are of Government manufacture.

Libraries.—Ship's libraries contain, besides strictly professional books, also such scientific, historical, law, and miscellaneous publications as are advantageous to naval officers for their service in all parts of the globe. The allowance of library-books is deemed liberal, considering the small appropriation made annually for the purpose. Recently, the Revised Statutes of the United States were added to ship's libraries, thus filling a want more or less seriously felt in the Navy for some time.

HYDROGRAPHY.

The work of geographically determining, to the nearest limit of error, as many points as are supposed necessary in Central America and in the West Indies, was prosecuted last year by the United States Steamer

Fortune, Lieutenant Commander F. M. Greene, and assistants. This work is now in progress; the Fortune being found unsuited, the Department has assigned the Gettysburg.

The longitudes of Panama, Aspinwall, Santiago de Cuba, and Havana, have been determined by means of the telegraph. It is proper to acknowledge the courtesy of the Cuba Submarine and the West India and Panama Telegraph Companies, which have without charge extended all the necessary facilities.

The work now in course of completion will include points on the Windward Islands and the northern coast of South America.

The survey of the outer coast of the peninsula of Lower California, and that of the Gulf of California, has been concluded by Commander George Dewey, commanding the Narragansett. The gulf was absolutely unsurveyed, but is now sufficiently examined and determined for the safety of navigation. The Bureau has the satisfaction of expressing its appreciation of what has been accomplished.

Commander A. T. Mahan, commanding the Wasp, has made much-needed surveys at the mouth of the Rio de la Plata.

Owing to no appropriations, the survey of the North Pacific Ocean has been abandoned; the work is so extensive that it would be a mere pretense if attempted without appropriations sufficient to purchase, or build by contract, a suitable steamer and two three-masted schooners to serve as assistants. The probable cost of a steamer and two schooners would be $170,000, for which an estimate has been submitted. Such vessels, once fitted out and employed upon their work, would entail little expense beyond that of cruisers, and in fact would serve that purpose most usefully among the islands visited by our own and other vessels, for cargoes of *beche-de-mer* and sandal-wood.

The survey of the North Pacific Ocean is a necessity; without it the loss of life and property will yearly increase; and as the ocean binds our coasts, it should be our pride, as it is our interest, to lessen the dangers of its navigation as much as possible.

It is respectfully recommended that, when a vessel can be spared for the purpose, from those employed on the North Pacific station, a running survey be made of the coast of Guatemala; this would render the surveys—of different values, however—continuous from Behring's Straits to Cape Horn. The report of the hydrographer, in this as in other matters, is worthy of your careful consideration.

Since completing the lines of deep-sea soundings in the Pacific Ocean for cable purposes, as mentioned in my last annual report, another line has been run by the United States steamer Tuscarora, under the command of Commander H. Erben, from San Francisco to the Sandwich Islands, and some soundings were also made on the return of the said vessel from the Navigator Islands to Honolulu.

Additional deep-sea soundings will soon be in progress as directed by you, between the Sandwich Islands, the coast of Australia, and New Zealand.

INTEROCEANIC SURVEYS.

This arduous work, which has been carefully prosecuted for five seasons by two or more parties, from the Isthmus of Tehuantepec to twenty or more miles south of the mouth of the Napipi on the river Atrato, is at length satisfactorily accomplished.

It is the duty of this Bureau to acknowledge the ability and energy of the different officers who have been in command, and the untiring zeal and intelligent and faithful exertions of their subordinates. The

precautions of those in command are shown in the fact that not one officer or man has succumbed to climatic influences, though doubtless many carried the seeds of disease and earlier death away from their fields of operation. No case of bad conduct, in either officer or man engaged on this work, has come to the knowledge of the Bureau.

The Tehuantepec survey in 1870–'71 was under the command of Capt. R. W. Shufeldt, U. S. N., assisted by naval officers and Civil Enginee E. A. Fuertes.

The survey of the Nicaraguan route was under command of Commander Charles S. Crosman, in 1872, who was unfortunately drowned on the bar of the San Juan River, on the 12th April, 1872. Commander Chester Hatfield, U. S. N., then assumed command, and prosecuted the work during the season. Commander E. P. Lull, U. S. N., who, as a subordinate, had been employed for two seasons on the surveys to the south and east, was placed in command, and executed a very satisfactory survey of this region, aided by young naval officers and by Civil Engineer A. G. Menocal, who also aided Commander Chester Hatfield the preceding season.

The survey of a long stretch of coast from the Isthmus of Panama to the extreme southern limit, on the Atrato, twenty miles or more above the mouth of that river, was under command of Commander T. O. Selfridge, U. S. N., during the years 1870–'71 and 1873, aided the first season by assistants from the United States Coast Survey, as well as by junior naval officers.

By tentative surveys, following in the main up the various valleys on both coasts, until reaching heights and distances apart that would make the different water-sheds between the points named inferior to other points already known, the process of elimination was completed. It was a long, laborious process, taxing the endurance of the officers and men.

Since my last report, at the request of the commission appointed to consider and report upon the interoceanic canal, by your order a careful survey of the Isthmus of Panama was made, the computations completed, and the whole placed before the commission. A reconnaissance on the west coast was also made of the Rio Chepo and the San Blas route, where the tide-waters of the two oceans approach more nearly than at any other point. This work was executed by Commander E. P. Lull, U. S. N., and junior naval officers, aided by Civil Engineer A. G. Menocal, U. S. N.

At the instance of Commander T. O. Selfridge, who had executed the former work on what is known as the Napipi route, the Department directed fitting out another expedition to make an actual location of an interoceanic canal along this line. This work was assigned to Lieut. F. Collins and junior naval officers. The work has been successfully accomplished, the computations made, and placed before the commission.

So careful and minute has been the examination of the different water-sheds up to the point of manifest inferiority to other known points, that no doubt now exists as to the approximate labor necessary in the construction of an interoceanic ship-canal at several points. It is proper to add, that the most careful and elaborate surveys would necessarily have to be made, in advance, at any point heretofore examined, before commencing the construction of an interoceanic ship-canal, and that these surveys could only ameliorate the labor and cost of construction, inasmuch as *the locations as given are actual throughout their length*, and would only be changed when an advantage would be gained by doing so.

NAVAL OBSERVATORY.

The report of the Superintendent of the Naval Observatory, herewith appended, presents the subjects under his charge so fully as to require no special notice of this Bureau.

NAUTICAL ALMANAC.

The report of the Superintendent of the Nautical Almanac will doubtless receive your approval. These publications are a necessity to the country, apart from the primary object, the necessary data for navigation. All institutions of learning, the Coast Survey, the surveyors of the Government, whether belonging to the Army or other departments, are supplied with the Nautical Almanac without charge.

SIGNAL-OFFICE.

From the report of the Chief Signal-Officer of the Navy it will be seen that an electric light has been purchased and experimented with, to ascertain its utility on board of men-of-war in certain contingencies. The experiments have not advanced enough to show whether or not the use of electric lights, in time of peace, will be of sufficient advantage to warrant the expense of supplying our vessels-of-war with them, while their utility in time of war is undoubted.

OFFICE OF DETAIL.

Under your instructions, as large a number of junior officers of the Navy has been detailed for duty on the United States Coast Survey as the urgent demands of the naval service will permit. Fifty officers of the Navy are now assigned to duty under the Superintendent of the Coast Survey. This duty is in itself a national necessity; it is also a most valuable school of instruction, as is shown through the services of naval officers in their legitimate duties, and especially during the different wars in which they have taken part.

Respectfully submitted.

DAN'L AMMEN,
Chief of Bureau.

Hon. GEORGE M. ROBESON,
Secretary of the Navy.

OFFICE OF THE SUPERINTENDENT OF COMPASSES,
BUREAU OF NAVIGATION, NAVY DEPARTMENT,
Washington October 25, 1875.

SIR: In conformity to your general instructions of March 28, 1873, I have the honor to submit the following statement of matters pertaining to the line of duty assigned to me under those instructions.

THE NAVY COMPASS.

During the past year all the liquid compasses at the several navy-yards upon the Atlantic Coast, which, as mentioned in my preceding

report, had been found defective in any respect, either from previous service or in being old and obsolete in some particulars, have been completely repaired and refitted, so that, as shown by inspection tests from time to time, these have been made as good and as serviceable in all respects as any of the new compasses most recently supplied by the makers.

The new azimuth circle has been in use for more than a year past, and, with the experience thus far had with it, I think it may be justly said to have realized the expectations expressed in regard to it in my report of 1873. Recently my attention has been given to the question of substituting silvered-glass mirrors for those of black glass, hitherto generally used in azimuth circles. In the use of the azimuth circle for observations of the sun, no difficulty arises from the employment of black glass reflectors, but it is quite otherwise when attempting observations of the planets and fixed stars at altitudes requiring them to be seen by reflection, as it is very troublesome and frequently impossible to get distinct views of such objects in this manner, and this difficulty is, of course, much increased with the double reflections in the use of the new circle. So far as my inquiry has proceeded, with a merely provisional arrangement of silvered-glass mirrors, the results have been fairly satisfactory. Some further trials with the mirrors properly adapted for good work will, I have reason to hope, place this question in a completely satisfactory light. With the urgent need, in my opinion, of more frequent compass-azimuths during the night, especially in the navigation of iron-built ships, such an extension of the resources of the azimuth circle as the convenient observation of planetary and stellar azimuths must be regarded as a desideratum of considerable importance.

INSPECTION OF COMPASSES.

The opinion expressed in the preceding report, that the adjusting of our Navy compasses and the subsequent testing of their adjustments at the compass-observatory had resulted in their continuous improvement, has found additional confirmation during the past year. At each successive examination some gain has been realized toward a practically perfect instrument.

But, although the use of the compass-observatory has fulfilled every requirement in the compass-maker's adjustments and the inspector's examinations at that place, a want of special facilities for these examinations at other places has been apparent, which it has seemed desirable to supply. To this end a portable compass-testing instrument has been devised which, while possessing all the resources for such examinations as the fixed observatory, shall admit of being readily carried from place to place, and of being set up and conveniently used wherever the Navy compasses are to be found. Such an instrument will, in my opinion, prove a useful auxiliary to our compass-work.

MAGNETISM OF SHIPS AND COMPASS DEVIATIONS.

Magnetic examination of the United States steamer Alert.—The United States steamer Alert, one of the new iron-built sloops of war, which had been fitted for a first brief service as one of the practice-ships of the United States Naval Academy, having proceeded from Annapolis on the 28th of June last down the Chesapeake Bay, I made a set of observations on the next day in Hampton Roads for determining the deviations of the compasses and magnetic elements of that ship.

Three compass positions had been established on board, as follows:

Distances.	Standard.	Steering.	Cabin.
	Feet.	*Feet.*	*Feet.*
From the taffrail	39.6	41.9	25.7
Above the main deck	12.7	3.7	5.9

The standard was on the poop, the steering-compass on the main deck, over the after-part of the ward-room hatch, and the cabin compass was suspended in the cabin to the under side of the poop-deck. The steering-compass was 57.7 feet aft of the center of the smoke-funnel.

The observations were made opposite Old Point Comfort, between 4.40 and 6.20 p. m., with the ship under steam, by time-azimuths of the sun. The observations for magnetic force, on shore, were made immediately afterwards.

I was assisted in these observations by the navigating-officer, Lieut. J. C. Rich, U. S. N., who had charge of the standard compass and observed the azimuths and headings with that compass. Lieut. W. H. Everett, U. S. N., in charge of the cabin-compass; Master F. E. Upton, U. S. N., in charge of the steering-compass; Passed Assistant Engineer J. L. D. Borthwick, U. S. N., in charge of the clinometer; and Master W. P. Elliott, U. S. N., who noted the times and recorded for Lieutenant Rich; the observations for horizontal and vertical force being made by me. Commander W. T. Sampson, U. S. N., in command, with the executive officer, Lieutenant-Commander O. F. Heyerman, U. S. N., rendered every facility and attention toward the accomplishment of my object, for which, and the co-operation of all, I beg to express my cordial appreciation.

The condensed results of these observations are given below.

Compass deviations and directive force on board the United States steamer Alert, in Hampton Roads, Va., June 29, 1875.

Ship's head by observed compass.	Compass-deviations.			At standard compass.	
	Standard compass.	Steering compass.	Cabin-compass.	Ship's head, magnetic.	Directive force.
	°	°	°		
N.	9.2 W.	16.0 W.	8.2 W.	N.	0.922
N. N. E.	9.2 W.	22.6 W.	33.0 W.	N. N. E.	0.944
N. E.	8.8 W.	27.2 W.	52.0 W.	N. E	0.968
E. N. E.	7.6 W.	30.0 W.	60.0 W.	E. N. E.	0.988
E.	6.2 W.	29.8 W.	59.8 W.	E.	1.010
E. S. E.	4.6 W.	25.0 W.	50.0 W.	E. S. E.	1.096
S. E.	1.0 W.	16.0 W.	33.0 W.	S. E.	1.144
S. S. E.	4.8 E.	2.4 W.	7.0 W.	S. S. E.	1.160
S.	11.2 E.	17.2 E.	25.8 E.	S.	1.120
S. S. W.	17.0 E.	35.8 E.	56.2 E.	S. S. W.	1.026
S. W.	17.0 E.	37.6 E.	74.0 E.	S. W.	0.904
W. S. W.	11.6 E.	32.0 E.	76.0 E.	W. S. W.	0.776
W.	4.4 E.	23.0 E.	69.0 E.	W.	0.700
W. N. W.	2.4 W.	13.0 E.	57.2 E.	W. N. W.	0.706
N. W.	7.2 W.	2.8 E.	40.0 E.	N. W.	0.780
N. N. W.	9.2 W.	7.2 W.	18.0 E.	N. N. W.	0.858

Magnetic elements of the United States steamer Alert, from observations made in Hampton Roads, Va., June 29, 1875.

Compass-position.	Polar force.		Quadrantal force.		Mean directive force, reduced to—		Mean vertical force.
	Intensity.	Direction.	Intensity.	Direction.	Magnetic meridian.	Magnetic equatorial.	
Standard	0.214	238°	0.074	15°	0.928	0.000	1.041
Steering	0.541	207	0.112	342	.....	0.017 W.	.....
Cabin	*1.023	195	0.071	23	.....	0.123 E.	.....

* This value is somewhat in doubt, although resulting from the observations, which are quite consistent. It is highly probable, however, that, by reason of the very low directive force acting at this compass on northerly and westerly courses, the deviations are somewhat at fault.

And, for the standard compass, the heeling deviation to windward (to higher side of ship) is, probably, for each degree of heel, 0°.45.

The deviations and other angles are expressed in degrees and tenths. The forces, with the exception of the vertical force, are expressed in decimal parts, in terms of the earth's horizontal force (directive force on shore) taken as 1.000. The vertical force is in terms of the earth's vertical force taken at 1.000. The direction-angles are reckoned from the ship's head, round the circle by way of starboard, stern, and port*.

It will be noticed that, although the several compass-positions are all aft on the Alert, and are not very different either in horizontal distance from the taffrail or in vertical distance above the main-deck, yet the differences in this ship's magnetic conditions, and in the corresponding compass-deviations at those positions, are quite remarkable. Thus, while the deviations of the standard compass are moderate, hardly exceeding what is sometimes found at the standard compass of a wood-built screw-steamer, it is otherwise with those of the steering-compass, which, at their maximum, exceed three points, while the maximum deviations of the cabin-compass are nearly seven points.

In reality, these results, whether in deviations or forces, so far as they concern the standard compass, reveal a very decided change in the magnetic condition of that part of the ship since my first examination, in October, 1874. At that time she had only recently been launched, and was moored at the dock, with her head sensibly in the same direction as while on the building-stocks. Her hull was complete, but no portion of the machinery had been set up. I then obtained the data from observations made at two stations on board—one being aft on the poop, 27 feet from the taffrail and 11 feet above the main-deck; and one forward on the forecastle, 7 feet from its after end—from which I have deduced the following results:

a. Results deduced directly from observed data:

	Aft compass.	Fore compass.
Ship's head, by compass	N. 29°.4 W.	N. 14°.0 W.
Compass deviation	9°.3 E.	6°.2 W.
Ship's head, magnetic	N. 20°.1 W.	N. 20°.2 W.
Directive force on board	0.154	0.732

b. Results deduced partly from assumed data:

Polar force of ship	0.860	0.281
Direction angle of polar force	198°	214°
Quadrantal force (fore and aft)	0.020*	0.020*
Mean meridional force	0.980*	0.980*
Mean vertical force on board	1.546	1.028
Vertical force for heading	1.576	1.058
Heeling deviation toward the higher side of the ship, for each degree of list	1°.8	6°.2

*The terms used are explained in a preceding report, (that of 1873.)

Begging it to be remembered that these results are deduced from observations on a single heading of the ship, and this the same as that on which the ship was built, it may be remarked, as to the influence of the assumptions upon the second group of results, that, within admissible limits for these suppositions, in a given case—

The polar force may be in error	$\pm 0^\circ.05$
The direction angle	$\pm 3^\circ$
The mean vertical force	$\pm 0^\circ.04$
The heeling deviation for 1° of list	$\pm 0^\circ.2$

The assumptions being in the values taken for the quantities marked with an asterisk, and in a small allowance for transient vertical induction, acting, however, to *diminish* the vertical force for heading, which is that actually observed.

It may, therefore, be concluded from these results—

1. That a powerful magnetism had been developed in this ship while being built, having its polar axis through the starboard bow and port quarter (with its south pole in the latter) inclined about 20° to port from the fore-and-aft line through the stern.

2. That the characteristic features of this magnetic condition, as found at the position of the aft compass, were, a greatly-diminished directive force (only about one-seventh of that due to the earth) and a greatly-increased vertical force (nearly one and six-tenths times that of the earth.)

3. That, in consequence of this magnetic condition, large deviations of the compass would have resulted, had the ship been swung upon different headings round the compass circle, which would have been westerly on easterly headings, and easterly on westerly headings, and which would have reached their maxima of five to six points on headings of about E. N. E. and W. N. W., respectively, and become nothing on headings of about S. S. E. and N. N. W., respectively; and that the directive force acting upon the compass would have allowed the card to be extremely sluggish on courses between N. N. E. and N. W.; and finally, that an additional deviation from heeling would have resulted, which, on northerly and southerly courses, might have been so great as 18° for ten degrees of heel—changing signs, as the ship heeled to starboard and port.

At the fore-compass station these conditions are comparatively moderate, and in part reversed.

On comparing these results with those found at the standard compass, (occupying nearly the same position,) on the completed ship in Hampton Roads, the evidences of change from the former condition are decided. The polar axis is now more toward the port beam, having swung round nearly 30° further from the stern; the variations in directive force are moderate; the vertical force is moderate, and the deviations not excessive. At first sight, it might be inferred that these changes were due to a large diminution of the ship's permanent magnetism, consequent upon the circumstances of her intervening experience, such as being anchored for some time on different headings and sailing on different courses, and the action of the winds and waves, &c. But it must be borne in mind that the machinery, boilers, and smoke-funnel have meanwhile been introduced, to which, and especially to the funnel, we must, I think, attribute a large part of this change in the magnetic conditions at the aft compass. The upper portions of this iron possess decided south polarity, like that developed and still existing in the port quarter of the ship, and being on the opposite side of the compass, is antagonis-

tic to the latter, and so far neutralizes its action as not only to pull the polar axis toward the beam, but to greatly reduce the deviations and nearly equalize the directive force at the standard compass; in short, acting as a corrector of that compass.

The steering-compass, being nearer the main-deck, although a little farther forward, is probably less influenced by the funnel; the polar axis at this position being less veered to port and the deviations not so greatly diminished.

The cabin-compass shows, however, a magnetic condition even more exalted than that found above the poop last year. In reality, the conditions are such as to leave our results somewhat in doubt as to this compass, although the curve of deviation, constructed from the observations, is remarkably consistent throughout with those obtained for the other compasses. It is quite certain, however, that the directive force at this compass nearly if not wholly vanishes on some courses, such as those between the N. and N. N. W. points by compass.

In the absence of any observations to afford a clue to the actual magnetic condition of this ship immediately subsequent to placing the machinery on board, it is impossible to say how great a change had taken place in the ship's magnetism prior to the observations in Hampton Roads.

The position of the standard compass on the poop, well forward and well elevated, appears, therefore, to be judiciously chosen; and no inconvenience in the use of this compass need result, with the proper application of its error on any required occasion. There is one qualification, however, which should be kept in mind, and this is the probable change from heeling, which might be nearly half a point on northerly and southerly courses, with a list of ten degrees.

In the fitting of the steering-compass, placed as it is before the wheel, upon the main-deck, advantage was taken of the ward-room hatch; and by placing the binnacle over its after part, while leaving sufficient room forward for the companion-way, the position selected is the best, probably, that could be had on the main-deck. The portion of the hatch is now filled with a wooden flooring; but it might be entirely removed and its place supplied with a glass light, should this ever be deemed desirable; a change which would only require a proper striding-support for the compass-binnacle.

The deviations of the steering-compass are much too large to be conveniently carried by this compass, and I should have laid down correctors, at least for its polar deviations, but the ship having to leave at an early hour the next morning there was no time for that, nor even the evening before for the requisite force observations at this compass position. In view, however, of the merely coastwise service of the ship during the summer, and of the considerable changes likely to occur during that period, the omission was of no material importance, so far as the navigation of the ship was concerned, especially as the compass itself was in excellent condition. But before the Alert proceeds on foreign service, it will be advisable to supply these omissions, through additional observations, and, indeed, to correct for heeling deviations, likely to be considerable for this compass.

The cabin-compass, although in good condition, is practically useless where it is placed. With iron beams closely above it, an iron deck below it, the extended iron bulwarks on either side, and the rudder-head and stern-post not very far aft, besides iron stanchions, &c., in its immediate vicinity, it is hardly to be expected that any compass, however excellent in itself, could properly perform its functions. Nor can the

compass-position be much if at all improved by any change within the cabin limits. Unfortunately, without the use of cumbrous appliances, the compass cannot be properly corrected.

Before passing from the consideration of the Alert and her compasses, I beg to call your attention to the excellent results of the observations in Hampton Roads, although the wind was rather fresh, making it somewhat difficult, and not always possible, to keep the ship to a perfect steady on some of the headings. As you are aware, I have for some time past recommended the substitution of celestial azimuths, (our only recourse at sea,) in our harbor and in shore observations of this kind, for direct bearings of a distant terrestrial object, the method hitherto generally used in the Navy. The method of time-azimuths of the sun is not only a much briefer and less laborious process than that of "swinging ship" at one of the Navy compass stations, but much more accurate and reliable when, as is generally practicable, we may rely on the time and other data within the requisite limits. In general, when observations are required near shore, we may depend on the time within $\pm 4^s$, the latitude within $\pm 1'$, and the polar distance within $\pm 1''$; so that our true azimuths may be depended on within $\pm 0.^\circ 1$; while the circumstances are quite as favorable for accurate observations of the compass azimuths as by the method of distant bearings of a terrestrial object, and even more favorable than by the method of reciprocal bearings, as commonly practiced. The principal objection to the use of the Navy compass stations, apart from the greater expenditure of labor and time, arises from the large errors of parallax, in consequence of the necessity of using objects much too near the station. As you are aware, nearly two days have been employed in some instances at one of these stations to obtain the data for a table of deviations; and yet, I am well satisfied that, with our improved facilities, much better results can be had with two hours of steaming and a subsequent hour in reducing the observations.

Use of the compass in Arctic navigation.—The prevailing impression among Arctic navigators appears to be that the compass is useless in those waters, and that it might as well be kept in a locker, as far as any reliable determination of sailing-courses is concerned. This idea, however founded, finds an appropriate illustration in a communication from Capt. W. H. Kelley, master of the American whaling-bark James Allen, said to have been published in the Hawaiian Gazette on the 9th December last; and a copy of the same having been transmitted by the United States consul at Honolulu to the Department of State, and referred by the latter to the Navy Department, it was finally referred to me.

Although not directly concerning the Navy, the subject is one of importance to all navigators, and alike from interest and duty I gave it attention. I beg, therefore, to present some of the conclusions at this time to which I arrived from its consideration.

I first subjoin the letter of Captain Kelley, together with that of the United States consul at Honolulu.

Editor of the Hawaiian Gazette:

SIR: One of the perplexities of the navigator cruising in the Arctic Ocean is the singular effect northerly and southerly winds seem to have upon the mariner's compass. Captains have noticed this singularity for years, and no solution of the matter, as far as I have learned, has yet been arrived at. Navigators have noticed that with a north or northeast wind they can tack in eight points, while with the wind south or southwest in from fourteen to sixteen points. All navigators know that for a square-rigged vessel to lie within four points of the wind is an utter impossibility, the

average with square-rigged vessels being about six points. This peculiar action of the compass renders the navigation of the Arctic difficult and at times dangerous, especially in thick, foggy weather. Navigators in these regions have proved to their satisfaction that on the American coast, north and east of Point Barrow, to steer a land course by the compass and allow the variation given on the chart, 44° 15′ east, with the wind at north or northeast, *would run the ship ashore steering either east or west.* Take, for example, the wind from northeast, the ship on the port tack will head east-northeast by compass; allowing the variation, 44° 15′ east, she will head nearly east-southeast true. Then put the ship about on the starboard tack, and she will head by compass northwest by north or north-northwest; on the other hand, with the wind south or southwest and the ship on the port tack, she will head north-northwest, and on the starboard tack from south-southeast to south, and at times north on one tack, south on the other. Question. Has the wind or temperature of the atmosphere any effect on the magnetic attraction or variation?

Experience, therefore, has obliged navigators to ignore the variation marked upon the charts, and lay the ship's course by the compass alone, to make a land-course safe in thick weather. The peculiar action of the compass has been attributed by some to local attraction; but if local attraction has this effect on the compass, why does it not act the same in all winds? With an east or west wind the effect on the compass is not so great as with other winds.

I have said this much to show the working of the compass in the Arctic Ocean during different winds, not that I admit that the wind has any effect whatever upon the compass. I give the facts as they come under my observation, and corroborative testimony will be borne by any ship-master who has cruised in the Arctic Ocean. We shall feel indebted to any of our scientific friends who will explain the mystery.

W. H. KELLEY.

No. 7.] UNITED STATES CONSULATE,
Honolulu, Hawaiian Islands, December 9, 1874.

SIR: I have the honor to inclose herewith a communication from Capt. W. H. Kelley, one of the oldest and best-informed captains in the American whaling-fleet, published in the Hawaiian Gazette of this place, this morning, giving the perplexities of the navigator in the Arctic Ocean, from peculiar influences on the compass, and asking of the scientific an explanation of the mystery. Captain Kelley is a citizen of New Bedford, Mass., United States, and has just returned to Honolulu from a voyage to the Arctic Ocean as master of whaling-bark James Allen, of New Bedford, Mass.

I am, sir, very respectfully, your obedient servant,

J. SCOTT,
United States Consul.

Hon. SECOND ASSISTANT SECRETARY OF STATE,
Washington, D. C.

Premising that we have no reason whatever for the belief that the direction of the wind has any influence upon the action of a compass, let us examine the question by giving due weight to the influence of known causes, and see what can be done toward clearing up the behavior of the compass upon the deck of an Arctic whaler, like what we may suppose the James Allen to be, as a representative ship of her class.

We shall assume, in the absence of positive information, the case of a wood-built sailing-ship of about four hundred tons, with the compass aft, and with sufficient iron on board, especially on and above the deck, in the form of trying-caldrons and lifting-tackle, even if there were no other in the ship, to cause a symmetrical compass deviation by its magnetic action, which at Honolulu should be at a *maximum not less than one to two degrees, east or west*, according as the ship is put upon courses to the *eastward* or *westward* by compass. Such a deviation, gradually decreasing from the maximum on or near the east or west courses by compass, to nothing on the north and south courses, would be too small to be generally noticed, and could only be appreciated on the various rhumb points of the ship's headings by means of careful observations.

Now let such a ship be placed in the Arctic Ocean, where our adventurous whale-men make their summer cruises; for example, "to the

north and east of Point Barrow." What are the probable changes in magnetic conditions to which she will be subjected from a change so decided in geographical position? Here we shall have to deal with probabilities, but within limits that will involve no material error to the subject of our inquiry. In the first place, then, the magnetic variation will have changed from about 10° east at Honolulu to about 40° to 45° east on the cruising-ground in question; secondly, the magnetic dip will have changed from about 25° north at the former position to about 83° to 85° north at the latter; and thirdly, the relative horizontal magnetic force (directive force of the earth) will have changed from about 1.75 to about 0.45.

Such changes in magnetic conditions are necessarily attended by important consequences to the magnetism of the ship, and to the action and use of the compasses on board. Thus, in the first place, there will be a large increase in the deviations found at Honolulu of not less than twenty to twenty-five fold, being proportional to the tangent of the magnetic dip; so that a deviation no greater than 1° to 2° on certain courses at the port of outfit might become at least 40° on the corresponding courses in the Arctic. And secondly, there will be a reduction of the earth's directive force in the ratio of about four to one; from which, with imperfections of the compass, such as considerable friction at the pivot and a deficient magnet-power, there would be liability to serious error from defective sensibility, manifesting itself in a greater or less "sluggishness" or deficient tendency of the compass-card to point in the direction of the directive force, which, in general, would be more troublesome, in the region under consideration, on courses to the southward and westward.

Let us next apply these consequences of the altered magnetic conditions to the Arctic experience narrated by Captain Kelley in his interesting letter; comprising the only data furnished by him through which we may test our conclusions on the one hand, or hope to explain the apparent anomalies of that experience on the other.

For this, by constructing a curve of deviations on the basis previously assumed, and disregarding any errors from defective sensibility of the compass—

First, let us apply our conclusions to the Arctic experience in tacking ship. Thus,

1. With the wind *northeast.*

On the port tack, the compass-heading of E. N. E. is E. S. E., magnetic; and on the starboard tack the compass-heading of N. N. W. is N. W. by N., magnetic—a difference of 13 points.

2. With the wind *southwest.*

On the port tack the compass-heading of N. N.W. is N. W. by N., magnetic; and on starboard tack, the compass-heading of S. S. E. is S ½ W., magnetic—a difference of 12½ points.

Hence, in this case, by applying both variation and deviation to the compass-courses, an approximate equality to the angle of tack results for each wind, supposed in opposite directions, thus showing the ship to lie within 6½ points of the wind in each quarter.

Secondly, let us take Captain Kelley's suggestive, and doubtless somewhat perplexing, nautical paradox:

Given the place of a ship, somewhere to the northeastward of the coast which trends in a southeasterly direction from Point Barrow, to make the land by steering a course by compass, *either east or west.*

1. The course set *east* by compass.

Applying the compass-deviation of 40° E. and we have S. 50° E., mag-

netic; and applying the magnetic variation of 40° E., we have S. 10° E. as the course true, from which we should expect to make the land.

2. The course set *west* by compass.

Applying the deviation, now 40° W., and we have S. 50° W. as the course magnetic; and, applying the variation, still 40° E., we have due west as the course true, and we might again expect to meet the land.

Thus, under the first supposition, the deviation and variation concur, and the resulting compass-error is 80°, or nearly eight points, and the ship goes southerly instead of easterly, as would appear by the compass; while, under the second supposition, the deviation and variation being opposite in name and equal, the resulting compass-error is 0°, and the ship pursues the course indicated by compass.

Thirdly and finally, let us take another of the conclusions from Arctic experience, referred to by Captain Kelley, namely, that of "ignoring the variation" (not much less than four points!) and laying the ship's course by compass solely in order to make a good land-fall. Now this may be quite correct, as we have already seen in our second application, provided the course be laid to the westward, but is rather the result of a fortunate concurrence of circumstances than deducible from very accurate premises. This would be quite evident if the land were to the eastward rather than to the westward of the ship, for then, instead of making land, or "running ashore," to set the course toward it by compass would only result in putting the ship farther off the land. In reality the explanation is to be found in the fact that, on westerly courses, the compass-deviation being probably about equal to the magnetic variation, (though it may be somewhat greater or less,) but with the *opposite* name, one nearly or quite neutralizes the other, thus leaving the compass course nearly or quite identical with the true course.

It is thus seen that, without justly imputing any improper behavior to the compass, except in cases of defective sensibility from an imperfect instrument, it is probably only adjusting itself in due subjection to those unseen but none the less controlling influences by which its action is always regulated.

As difficult as it is sometimes for the navigator to appreciate the effects of these changes in the earth's magnetic action, they are, nevertheless, as well founded in fact from actual observation as they are justified from theoretical considerations.

In the present case, and probably in most cases, with the defective compasses in ordinary use by the Arctic navigators, it is not unlikely that the results in a particular instance, such as those noted in the preceding examples, may be modified more or less by those defects, especially under the greatly reduced directive force in the Arctic Ocean; so that whether our assumptions are entirely or only approximately accurate can only be determined by careful observations on board the ship.

Two practical inferences, of great importance to Arctic navigation, may, I think, be justly deducible from the preceding considerations, and these are—

First, in the use of the best compasses to be found; such, for example, as, while possessing the highest *sensibility*, shall have the greatest *magnet-power;* and the instruments should be so thoroughly made and adjusted, while properly constructed, as to insure the smallest tendency to defect of the former or weakening of the latter, during the period of one cruise at the least. And during the intervals of lying in port and refitting, the compasses should be carefully examined by competent persons, and their ascertained defects corrected. It is true that a similar regard

should be had for their compasses by the navigators of all sea-going ships; but while this is generally necessary, it should be deemed indispensable to those who are compelled to encounter the trying circumstances of Arctic navigation. Undoubtedly, such compasses would be more costly than those too commonly used in merchant-ships; but, surely, an instrument upon which the safety of the ship and all on board depends is, at the least, as valuable as a spare anchor. And yet there are compasses in use that might as well be kept in a locker; they might better be kept in a junk-shop.

Secondly, in the frequent determination of the compass-error. With good compasses, like those just indicated, they could be depended on to point correctly even in Arctic waters, notwithstanding a low directive force. But it *should point in the direction of that force*, which, as suggested by the large magnetic variation on all courses, and by the probably large compass-deviations on certain courses, but running through all the changes down to nothing on certain other courses, must be something *quite different from the true meridian* in those waters. There is no help for it, then, but in the frequent finding of the compass-error; which, it should be remembered, is not the variation alone, nor the deviation alone, but both combined; that is to say, the actual difference between the compass-bearing of some celestial object, as found by observation, and the true bearing of the same object, as found by computation or inspection from tables.

With such a practice on the part of our Arctic navigators, not only would they make their land-falls with tolerable certainty, (even in thick weather, with observations made on the proper courses in advance of unfavorable circumstances,) but with a collection of such data as the compass-error on different compass-courses, in connection with the approximate position of the ship on each occasion, it might be possible to clear up some of the perplexities of Arctic cruising, at least with reference to the particular ship furnishing that information, while much instruction could be derived of general application.

I am, sir, very respectfully, your obedient servant,

B. F. GREENE,
Professor Mathematics U. S. N., Superintendent of Compasses.

Commodore DANIEL AMMEN, U. S. N.,
Chief of Bureau of Navigation.

UNITED STATES HYDROGRAPHIC OFFICE,
BUREAU OF NAVIGATION,
Washington, July 31, 1875.

SIR: With the report of the progress of this Office during the past fiscal year, I have the honor to submit, inclosed, the estimates for the fiscal year ending June 30, 1877.

During the year ending June 30, 1875, the work accomplished by this Office has been as follows: Nine new plates engraved; ninety-one charts prepared and photolithographed; sixty-six engraved plates corrected to a greater or less extent; corrections made by hand on three hundred and twenty-six photolithographed charts; seven charts completed, and in the hands of the engravers; and two charts ready for engraving.

During the year, six thousand and fifteen charts, and one thousand seven hundred and sixty-one books, relating to navigation, sailing direc-

tions, &c., have been sold to the agents of this office, in addition to the number furnished to the Navy as required.

The force of draughtsmen and engravers employed by this Office is so limited by the small appropriation that the rapid advancement of work is impossible, and valuable information has often to be long retained ere it can be put in shape for publication.

Sailing directions for the northwest, west, and south coasts of Spain and the coast of Portugal, for Madeira, the Salvages and the Canary Islands, and for the Azores, mentioned in my last yearly report as in the hands of the printer, have been received and issued. Remarks on the coasts of Lower California and Mexico; tables for finding the distance of an object by two bearings; deep sea-soundings obtained by the United States steamer Tuscarora in the North Pacific Ocean; sailing directions for the Rio de la Plata; the fifth and sixth supplements to the papers on the northern and eastern extension of the Gulf Stream; and directions for the running survey of an island, have been completed, printed and issued. The annual lists of foreign lights, together with hydrographic notices and notices to mariners, have been issued as usual. The "Navigation of the Pacific Ocean" has been completed, and is now in the hands of the binder.

The assistant hydrographer, and the officers employed in this branch, deserve great credit for their persevering diligence in this work, which requires so much careful and laborious research.

The re-examination of portions of the survey in the Gulf of California by Commander Dewey and the officers of the United States steamer Narragansett having been completed, owing to the entire failure of an appropriation for surveys, the Navy Department has found it necessary to withdraw the vessel and abandon the survey for the present. The engraving of the greater part of the charts constructed by this survey must be postponed until a suitable appropriation can be obtained. The work of the survey has been faithfully performed, and reflects much credit on Commander Dewey and the officers under his command.

Casual surveys and examinations of reported dangers to navigation have been made and forwarded to this Office by Commander Ramsay and officers of the United States steamer Ossipee; of the United States steamer Wasp, Commander Kirkland; the United States steamer Brooklyn, Captain Truxtun; the United States steamer Canandaigua, Captain Barrett; the United States steamer Canandaigua, Captain Lowry; the United States steamer Ashuelot, Commander Matthews; the United States steamer Omaha, Capt. P. C. Johnson; the United States steamer Monongahela, Captain Thornton; and an excellent survey from Flores Island to Punta Brava, in the Rio de la Plata, by Commander Mahan and the officers of the United States steamer Wasp.

The expedition for the determination of longitudes by means of the electric telegraph through the West India Islands, under the command of Lieut.-Commander F. M. Green, U. S. N., left Norfolk in the United States steamer Fortune 22d November, 1874. The work has been very successful, connecting Panama, Aspinwall, Jamaica, St. Jago de Cuba, and Havana. After establishing the observatory at Key West, the appearance there of the yellow fever decided the Department to direct the return of the party, and to postpone further operations until the next favorable season. The summer will be employed in making calculations, in bringing up the work already done, and in making preparations for its continuance. Much ability has been shown by Lieutenant-Commander Green and the party under his command in the prosecution of this work, the computation of which, thus far, showing that the results will be eminently satis-

factory. Under directions most courteously given by the president of the Cuba Submarine Telegraph Company and of the West India and Panama Telegraph Company, every facility was extended by the employés of the lines of telegraph, and much of the satisfactory accomplishment of the work is due to their intelligent and ready co-operation.

The work was also much facilitated by the interest taken in it by the officials of the government of the several stations.

In the island of Cuba, Louis de la Pila, a lieutenant in the royal Spanish navy, was detailed for the purpose of assisting the expedition. He rendered valuable aid to the observers at St. Jago de Cuba and at Havana.

I am compelled again to draw the attention of the Bureau to the unfitness of the building at present rented for the hydrographic office, both as regards want of accommodation and from an entire absence of any fire-proof attachment. As I have stated in my former reports, the building used for this office should, in my opinion, be the property of the Government, and sufficiently fire-proof to protect the valuable property accumulated and constantly increasing here.

Now, as heretofore, I recommend the purchase of this property if it can be obtained at a moderate price, with an appropriation for its repair and for such fire-proof additions as required. I again submit an estimate for the survey in the Pacific Ocean, with the hope that this necessary work may be continued; and also an estimate for engraving the charts already constructed of the survey of the peninsula and gulf of California, including that of the mouth of the Colorado River and as far as Port Isabel, the head of ocean navigation on the Colorado.

This is the only survey existing of the mouths of this river.

A careful and thorough examination and survey of the Pacific Ocean, so necessary to the greater safety of commerce in those waters, can, when the proper vessels are once furnished, be conducted from year to year with a very small additional expense to the Government. The most economical method, I believe, would be, as suggested by the Bureau in its report of the last year, to prosecute the survey with one steamer and two three-masted schooners, each having one or two steam-cutters; these, however, should be constructed for the service required.

Much valuable information can be and is obtained from casual examinations by vessels of the several squadrons; but there is no squadron that is able to detail one of its vessels for a sufficient length of time to make an extended survey, and it is seldom that squadron duties will permit more than occasional superficial examinations of doubtful positions or dangers to navigation, and unless such work is intelligently and most carefully conducted it is useless, doubts are not removed, and no hydrographer can take the responsibility of erasing these obstructions to navigation, which are a constant source of anxiety to navigators, from the charts, as long as he sees that the examination to ascertain their existence or otherwise has not been strictly conducted, in every particular, or that any loop-hole has been left open by the examiner for the escape of the danger.

Included in the large unsurveyed portion of the coasts and waters of the Pacific Ocean, is a large stretch of the coasts of Mexico, Salvador, and Guatemala, from the Rio Dulce to the Gulf of Fonseca, a distance of about eight hundred miles of coast-line, along which the vessels of the Pacific Mail Company are constantly running; this has only been explored, the existing charts being taken from an old Spanish manuscript, without sufficient data to locate or delineate it in a satisfactory manner. A running survey and examination of this stretch of coast,

even, would occupy a vessel at least four months, and it is but a fraction of the work required in this ocean.

Very respectfully, your obedient servant,

R. H. WYMAN,
Commodore U. S. N., and Hydrographer.

Commodore DANIEL AMMEN,
Chief of Bureau of Navigation.

UNITED STATES NAVAL OBSERVATORY,
Washington, October 25, 1875.

SIR: I have the honor to submit the following report of the observatory for the current year:

ASTRONOMICAL WORK.

The 26-inch Equatorial.—This instrument continues to be employed in the observation of the satellites of the planets Neptune, Uranus, and Saturn. Some of the more difficult and interesting of the double stars are also observed; and drawings of Mars, Jupiter, and Saturn, and of several nebulæ, have been made by Prof. E. S. Holden and Mr. Trouvelot, of Cambridge.

The following is the report made by Professor Holden of the drawings of nebulæ, &c.:

Mr. L. Trouvelot, formerly engaged at the observatory of Harvard College, was invited by the Superintendent of the Naval Observatory to visit Washington for the purpose of making drawings of nebulæ, planets, &c., as they appear in the 26-inch equatorial.

Mr. Trouvelot visited the observatory during the last part of September, 1875, and while there made pastel-drawings of two nebulæ, viz, the nebula, No. 4,403, of Herschel's General Catalogue, and part of the nebula Orionis, General Catalogue No. 1,179, as well as a pastel-drawing of the planet Saturn. These drawings represent the appearance of these objects during the period from September 21 to October 2, 1875. The method of making the drawing of Saturn was first to prepare, from the Nautical Almanac data, a pencil-drawing of the planet about four or five inches in extreme dimensions. This was taken to the telescope, and careful studies of the planet made on every clear night. These studies were afterwards embodied in a pastel-drawing on a much larger scale, so that the diameter of the ball of the planet was about 10 inches. This completed drawing was not compared with the heavens, as the limited time at Mr. Trouvelot's disposal did not permit a sufficiently long stay. It may, however, be regarded as compared, since another such pastel-drawing, made by Mr. Trouvelot in Cambridge, was so compared, and a copy made of this, in which the changes due to the 26-inch telescope were embodied.

The drawing of the nebula, General Catalogue, 4,403, (R. A. $=18^h\ 12^m$; N. P. D. $=106°$,) was made in the following way: A net-work of squares (of which the sides were about one minute of arc) ruled on glass was inserted in a negative eye-piece magnifying 130 diameters. This was placed in the telescope, and the latter was so pointed that the brightest star in the nebula should always be in the corner of one of the squares, and the clock-work motion of the telescope was so adjusted as to keep this star in its proper position. A piece of drawing-paper was ruled into squares, similar to those of the reticule, and on this were put down the brighter stars of the nebula, and some of its most prominent lines and boundaries. Then this eye-piece was removed, and a positive, magnifying about 400 diameters, was substituted, with which most of the smaller stars were put in by allineation, and the details of the nebula drawn.

Occasionally, an eye-piece magnifying 300 diameters was used. It is to be remarked that the error of a star-position by this method is quite large compared with the error of a similar position determined by transits or by a filar micrometer; but, on the other hand, the rapidity of the process is comparatively very great.

Owing to a previous study of this nebula by means of his 6½-inch equatorial, and the consequent familiarity with the conformations of the star-groups, Mr. Trouvelot was enabled to put in most of the bright stars in one night; an amount of work which the use of the filar micrometer would require at least thirty times as long to perform.

To test the accuracy of Mr. Trouvelot's star-positions, I examined his original drawing of the stars in this nebula, comparing his co-ordinates of eleven of the principal

stars with those measured by Lassell in 1863, and given in Mem. R. A. S., vol. 36, p. 49. The scale of Mr. Trouvelot's drawing is 1 inch = 129″.3, nearly.

Number of star.	Lassell.		Trouvelot.		Trouvelot – Lassell.	
	Δ α	Δ δ	Δ α	Δ δ	In α	In
	″	″	″	″	″	″
1	+114.2	− 68.3	+116.1	− 64.5	+ 1.9	− 3.8
3	+162.9	+160.3	+163.4	+157.0	+ 0.5	− 3.3
4	−492.6	+ 18.6	−473.0	+ 8.6	+19.6	−10.0
5	−284.3	−196.8	−281.7	−187.0	+ 2.6	+ 9.8
6	+120.7	−158.2	+124.7	−165.6	+ 4.0	− 7.4
7	+ 12.3	+ 38.8	+ 30.1	+ 43.0	+17.8	+ 4.2
8	+ 5.9	+137.8	+ 17.2	+137.6	+11.3	− 0.2
9	− 4.6	−177.5	− 10.8	−178.4	− 6.2	− 0.9
10	+189.8	+ 32.7	+187.0	+ 21.5	− 2.8	−11.2
11	+113.3	+ 63.0	+118.2	+ 64.5	+ 4.9	+ 1.5
12	−365.9	+ 12.8	−352.6	+ 6.4	+13.3	− 6.4
Mean without regard to sign					7.7	5.3

The foregoing table shows that the error of Trouvelot referred to Lassell is about 8″ in R. A. and 5″ in declination. I am inclined to suppose that the average error of a star-position determined by this method under favorable circumstances is less than 6″, for the reason that the clock-work motion of the telescope was not in good running order, and that consequently the standard star was not always in its correct position in R. A., while its declination was not affected, as the wires had previously been placed in the parallel. This is confirmed by the magnitude of the residuals; those in R. A. being much greater. This average error of 6″ would not amount to a change of $\frac{1}{20}$ of an inch in the position of a star in a drawing which could be put upon an ordinary quarto page.

By laying down on Mr. Trouvelot's original drawing a circle of the size of Lassell's field of view, and identifying the latter's stars, I find that this drawing lacks the following stars laid down by Lassell, namely, Nos. 25, 26, 27, 29, 36, 37, 38, 48, 51, 54, 56, 59, 60, 62, 64, 65, 66, 68, 69, and 74; 20 in all; while there are 29 which are not laid down by Lassell in the same space.

The explanation of this discrepancy is very simple. Each observer laid down peculiarly those stars which seemed to him to be required for the delineation of the nebula, and while it was attempted in a general way to put in all the brighter stars, yet if on a casual inspection of any space void of nebulous matter no stars were at once seen, the eye immediately turned to a space where the results of the work would be more valuable. The star-magnitudes are much more carefully assigned by Lassell; and it would be a work of value to re-examine this nebula carefully with the object of detecting any change in the relative brightness of its contained stars. This work could not be done during the few hours which circumstances allowed to be devoted to this nebula during this year.

After the principal stars were inserted, and the prominent outlines put in, the drawing of the nebula was commenced by means of a lead-pencil and stump. This was continued until a satisfactory result was reached, the nebula being depicted in black on a white ground. A pastel-drawing of large size was then made from a tracing of the original stump-drawing. The appearance of the nebulous matter can be well represented in this way. This drawing was then taken to the telescope and carefully compared with the heavens, and any changes were at once made without moving out of the observing-chair. The principal advantage of pastel-drawing consists in this facility in making corrections. A few of the smaller stars were then put in by allineation. It is well to remark that the brighter portions of this nebula give evidence of its resolvability. All the brighter parts of the "horseshoe," and of the long branch extending from star No. 8 to star No. 71, seem, under intense looking, to be just ready to break into small stars. Many small points of light were put down both by myself and by Mr. Trouvelot, which are not included in the preceding enumeration; but it was soon found that such a task was endless, and of far less importance than the correct delineation of the nebulosity. For nearly all the details of this, Mr. Trouvelot is responsible, as time did not allow of that careful and independent comparison which it is desirable should always be made; but it may be said briefly, that there are no conjectures laid down on the drawing. Everything is as it was seen. I confined my attention principally to the space limited by stars 1, 6, 9, 61, 63, 70, 20, 8, 3, 10, on account of the evidence from older drawings that this portion has moved relatively to the stars; and I can vouch for its general accuracy. It is sufficiently correct to found

an argument for or against variability. For example, I am sure that the brightest mass of nebulosity *follows* star No. 1, as Mr. Trouvelot has drawn it; and I am sure that the general direction of the dark channels between stars 7 and 53 is correct in the drawing. Also, it is certain that the general effect of the whole nebula is kept in the pastel-drawing.

The stars in the nebula of Orion were laid down by me from G. P. Bond's catalogue of them (Annals H. C. Observatory, vol. v) on a scale of 1 inch = 32 seconds of arc; and the central portion of the nebula was drawn by Mr. Trouvelot on this sheet, and afterward completed in pastel.

No attention was paid to the stars in this case, as all of Bond's in the limits of ± 300″ from the trapezium had been carefully verified by myself in the years 1873 and 1874, and a few stars (four in all) added. One of these was independently discovered by Lassell and by Alvan Clark, jr., with the Chicago 18½-inch telescope.

The drawing of the nebula Orionis may be considered a preliminary sketch of fair accuracy; and, during the coming opposition, it will be corrected. The drawing of Saturn has been verified in every point by myself, except as to the existence of notches in the inner edge of the outer ring. Mr. Trouvelot is certain of these. Distinct markings on a rosy belt were well seen, and are given in the drawing. The color of the belt is similar to that of the belt of Jupiter, but a little more rosy than I have seen Jupiter's belts during this opposition.

This instrument is in good order, and is in constant use. The dome is also in good condition, and works well. Thes ailc-loth shutters need to be renewed occasionally, but give as little trouble, perhaps, as anything that can be used. During the past summer the driving-clock has given considerable trouble, and it requires some improvements. It is doubtful if a clock of this construction can ever be made to move the telescope with very great steadiness; but by constant care and attention the present clock can be made to perform tolerably well. A chronograph, made by Alvan Clark & Sons, has been added to the equipment of this instrument, and also a clock by Frodsham, which is not yet mounted.

Operations with the Transit-circle.—This instrument has been in charge of Prof. John R. Eastman. Assistants Edgar Frisby and A. N. Skinner were on duty throughout the year. Assistant Ormond Stone was on similar duty until his resignation on March 20, 1875. On August 4, 1875, Assistant Henry M. Paul reported for duty and was assigned to the transit-circle.

This instrument has been employed in observations of the sun, moon, and planets, and of a large list of miscellaneous stars, whose places were desired, (1) for the reduction of observations made with the 9½-inch equatorial; (2) as zero-points for the formation of a catalogue from the zone-observations made here in the years 1846 to 1849; (3) for the use of Lieut. G. M. Wheeler, Corps of Engineer, United States Army, in the reduction of the zenith-telescope work of his parties engaged in surveying and exploring the Western Territories; (4) for the use of Lieutenant-Commander F. M. Green, in his determinations of latitude in the West Indies.

In January last a series of observations was begun of all the stars of the British Association Catalogue between 120° 0′ and 131° 10′ North-Polar Distance, that have not been observed here three times in both right ascension and declination.

Owing to the pressure of other work, the observations of Nautical Almanac stars have been generally limited to those necessary for the determination of time and azimuth, and for reflection-observations.

In October, 1874, clock-signals were exchanged on five nights with Lieut. G. M. Wheeler's observatory at Ogden, Utah, to determine the longitude of that station. A report of this work will appear as an appendix to the volume for 1874.

The roof of the transit-circle observing-room is still in a very unsatisfactory condition, and should be rebuilt on an entirely different plan.

A new apparatus for determining "personal equation," devised by Professor Eastman, has been procured for use with the transit-circle. There has also been placed in that room a new apparatus for facilitating the observations of stars by reflection.

The 9.6-inch Equatorial.—During the summer and autumn of 1874 this instrument was employed by several persons to observe occultations in connection with the observers of the transit of Venus. On October 15, 1874, Professor Eastman was directed to take charge of it. In November the instrument was employed by Professor Holden in observations of Juno. In the latter part of the month, water was found between the lenses of the object-glass, and the usual means taken to remove it. A stain was left on the glass, and the lens will probably require repolishing.

This instrument has been principally employed by Professor Eastman in verifying the computed places of the asteroids, before attempting to observe them with the transit-circle.

Mural circle.—During the past year Professor Yarnall has been engaged with the mural circle in making observations required in order to complete the star catalogue for a second edition, which he purposes to prepare before being retired on account of age. His success with his instrument has been gratifying. His continued health and strength have enabled him to do as much work as in previous years. His time in the office has been employed in reducing his work and preparing it for the press, and it is now nearly ready for publication. He has also read the proofs for the volume which is now in press, and which will shortly be published—the volume for 1873. He has the assistance of Professor Lockwood in revising his work, and in making such copies of it as are necessary.

Theoretical investigations.—Professor Newcomb remained in charge of the great equatorial until May last, when he was relieved at his own request, in order to give him more extended opportunities for pursuing the astronomical investigations he had in hand. The first of these was the discussion of the measures of the satellites of Uranus and Neptune made by him with the great equatorial. This work has been finished and printed. It is believed to have led to by far the most certain and satisfactory determination of the orbits of those satellites, and of the masses of the planets, which have yet been made.

Congress having failed to make the appropriation asked for last year, there is but little progress to report on the work on the theory of the moon's motion. This circumstance is much to be regretted, in view of the large and increasing errors of the lunar ephemeris, and of the fact that it is chiefly to these investigations that the astronomers of the world are looking for an explanation of the errors in question. An appropriation of $3,000 is therefore asked for, with a view to their continuation.

A preliminary investigation, having in view the correction of the lunar ephemeris during the last few years, in order that it may be used for the determination of the longitudes of the transit of Venus stations, is now in progress. Most of the preliminary computations have been made by Mr. D. P. Todd, under the direction of Professor Newcomb, at the expense of the appropriation for the transit of Venus.

Professor Newcomb deems it proper to make honorable mention of the disinterested services rendered by Mr. D. P. Todd, who, without pay, is rendering valuable assistance in the observations with the two equatorials.

Meteorology.—This department has continued, since my last report,

in charge of Professor Eastman. The usual observations with the barometer, and the dry, wet, and solar thermometers have been made by the watchmen at 0^h, 3^h, 6^h, 9^h a. m., noon, and at 3^h, 6^h, and 9^h p. m., on each day.

A series of experiments, to ascertain the effect of wind and of variable hygrometric conditions, or the amount of rain obtained in rain-gauges of various sizes, and at different altitudes, was made by Professor Eastman in 1874, and the results will appear in an appendix to the meteorological observations for 1874.

That portion of the annual volume for 1874 containing the meteorological observations is now in press, and a few extra copies will soon be issued for exchange with our meteorological correspondents.

Chronometers.—There are at present 90 chronometers under comparison, of which 83 are ready for issue, and 7 undergoing trial. Ten are awaiting an opportunity to be sent for repairs to Messrs. Negus, who have continued to do the cleaning and repairing of instruments for the Observatory. This firm has in hand, at present, 14 chronometers, having sent 11 here during the year in good order.

Sixty-six chronometers and 19 comparing-watches have been received from all sources, and 29 chronometers have been issued for use.

Lieutenant-Commander C. H. Davis, jr., was detached from duty in this connection June 1, 1875; Lieutenant-Commander C. H. Pendleton, September 6; and Lieut. L. G. Palmer, October 3. Lieut. Conway H. Arnold is at present the only officer on duty with the chronometers.

During the past two months, time has been transmitted at noon over the country through an additional wire from the Observatory to the Western Union Telegraph office. It is now transmitted by two wires, instead of one, rendering its reception more certain, and necessitating less trouble in repeating at the telegraph office.

The Library.—The number of volumes and of pamphlets received during the year has fully equaled that of past years. The increase in the total number on the shelves of the observatory is effected almost entirely by the exchanges through the annual distribution of its own publications, the cost of which is thus largely returned to the Government by the building up of a scientific treasury. A moderate appropriation of money, however, is recommended as necessary for the purchase of works of high character not issuing from scientific institutions, and, therefore, not available by exchange.

The distribution of the volume of observations made during the year 1872, as well as of its separate appendixes, and of the papers published by the commission on the transit of Venus of December 8-9, 1874, has been promptly and fully effected.

Gilliss's zones.—It will be remembered that, in 1849, the United States sent the late Captain Gilliss to Chili in charge of an astronomical expedition, whose primary object was to make certain measurements on Venus and Mars, with a view to the better determination of the solar parallax. The expedition spent more than three years in Chili, and accumulated a vast amount of material, among which was the most extensive series of zone-observations which had ever been made in the southern heavens. Upon the return of the expedition to the United States, the work of preparing its observations for the press was at once commenced, and prior to the death of Captain Gilliss four volumes had been published. It was his intention to have issued two more volumes, one of which was to have contained his observations of standard stars and the other his zone-observations. After his death, it did not seem practicable to continue the work on the original plan,

but, at the earnest solicitation of many eminent astronomers, an effort was made to publish the places of the stars in the form of catalogues. In accordance with this plan the catalogue of the standard stars, which formed a quarto pamphlet of 73 pages, was published by the observatory in 1870. Some work was also done on the reduction of the zones; but the funds available for that purpose being soon exhausted, application was made to Congress for more money, and $1,500 was granted in the naval-appropriation bill approved March 3, 1873. It was supposed this would suffice to finish the work; but the computations proved more tedious than was expected, and when the money was expended the work was once more laid aside. As the Argentine government has recently established an observatory at Cordoba, in which zone-observations intended to supplement the work of Captain Gilliss are at present being made, it is now more than ever important that the work of that officer should be reduced and published. With that view, I entertain a hope that Congress may be induced to appropriate the sum of $1,500 at its next session, which will be sufficient to finish the work.

OBSERVATIONS OF THE TRANSIT OF VENUS.

The following is an abridged statement of these observations at the several stations:

Northern stations.

	No. of photographs.
Vladivostok, Siberia	13
Peking, China	90
Nagasaki, Japan	60
Total	163

Southern stations.

Kerguelen Island	26
Hobart Town, Tasmania	39
Campbell Town, Tasmania	55
Queenstown, New Zealand	59
Chatham Island	8
Total	187

Contact-observations were obtained at the American stations, as follows:

First external contact.—Northern stations: Vladivostok, Peking, Nagasaki. Southern stations: Kerguelen, Queenstown.

First internal contact.—This was observed at the three northern stations, but only at Queenstown in the south.

Second internal contact.—This was also observed at all three northern American stations, but at only a single southern one—Campbell Town.

Second external contact.—This was observed at only a single one of the eight American stations—Peking.

Professor Newcomb has expressed the following opinions concerning the value of these observations; and concerning the probable error of the final determination of the solar parallax resulting from their discussion:

It is my opinion that the optical observations of contacts made by the observers of all nations will, by their combination, give a value of the solar parallax of which the probable error will lie between 0″.02 and 0″.03. I also think that the American photographs alone will give a result at least as accurate as this, and probably more so. A large remaining mass of material will be the heliometer measures made by the Germans and Russians, as well as Lord Lindsay; various optical measurements made near

the moments of internal contacts, and photographs in which Venus was partly on the sun. The combination of all these may be expected to give a result of equal weight with either of those already mentioned. I think, therefore, that we may look forward with considerable certainty to seeing the probable error from the combination of all observations, less than 0″.02, and, perhaps, not much more than 0″.01. At the same time, it is not to be disguised that there is a possibility of unforeseen perturbing causes being brought to light by a comparison of all the observations which will upset all our *a priori* estimates of probable error.

During the past year the store-room for the safe-keeping of expeditionary instruments—particularly those employed in the observations of the transit of Venus—has been thoroughly repaired; provision has been made for the preservation of the records, notes, papers, and results (especially the photographic plates) of the transit parties. In this is included the means of making the micrometric measurements with the least possible risk to the plates themselves.

With regard to the old buildings of the observatory, I regret to say that in many respects—embracing among others painting and the furniture of the offices—they are in a dilapidated condition.

Very respectfully, your obedient servant,

C. H. DAVIS,
Rear-Admiral, Superintendent.

Commodore DANIEL AMMEN, U. S. N.,
Chief of Bureau of Navigation, &c., Washington, D. C.

NAUTICAL ALMANAC OFFICE,
Washington, D. C., October 21, 1875.

SIR: I have the honor to submit the following report of the operations of this Office during the past year.

The preparation of the American Ephemeris and Nautical Almanac has continued as in previous years. The Ephemeris for each year comprises all relating to the places of the sun, moon, principal planets, and standard stars that is desired by astronomers in such a work. During the past year 520 copies have been sold, and 720 have been distributed to the ships and stations of the Navy; to the surveying and exploring parties of the Army, the Coast Survey, and the Land-Office; to observatories and astronomers and to various colleges and other public institutions, especially to those in which astronomical observations or investigations are conducted.

A smaller volume, containing the first half of the complete Ephemeris, is published for the use of navigators. More than 4,000 copies of the almanac for each year are required for the supply of merchant-ships.

There have been printed during the year 200 copies of the Ephemeris for 1875; 1,000 of the Ephemeris for 1876; 500 of the Ephemeris for 1878; 3,400 of the small almanac for 1876; 1,000 of the small almanac for 1878; and 200 of tables for finding the latitude of a place by altitudes of Polaris. The latter is a small pamphlet extracted from the Ephemeris of 1877.

The small almanac for 1878 was received from the printer in January, and the complete volume for 1878 in July of the present year.

The small volume for 1879 is completed and stereotyped, and it is expected that the entire Ephemeris for that year will be issued before April next.

Arrangements have been made for the preparation of ephemerides of twenty-six of the forty-three small planets discovered by American astronomers. It is desirable that ephemerides of all of them should be prepared by citizens of our own country. The appropriation of $3,000 a

year is insufficient for the purpose. Four thousand dollars would be required.

I have already submitted estimates for the expenses of this Office in the next fiscal year.

I am, very respectfully, your obedient servant,

J. H. C. COFFIN,
Professor of Mathematics, U. S. N., Superintendent.

Commodore DANIEL AMMEN, U. S. N.,
Chief of Bureau of Navigation, Navy Department.

UNITED STATES NAVAL SIGNAL-OFFICE,
Annapolis, Md., October 12, 1875.

SIR: I have the honor to submit the following report of the operations of this office during the past year.

In December last a series of experiments was commenced with an electric light and magneto-electric machine, constructed by Prof. M. G. Farmer, of Newport, R. I., with a view to its usefulness aboard ship for signal-purposes, searching for torpedoes, preventing collision or surprise, &c. These experiments have continued at intervals during the year and have satisfactorily proved that a continuous light may be obtained ashore. The lamp is now in Professor Farmer's hands for some slight alterations, and when returned will be placed on shipboard for tical experiment in the harbor and bay.

Careful examination has been made of the merits of various patterns of running-lights for vessels, among them those Barbier and Fenestre, Felthausen and Russell, and others, both French and American.

Various systems of fog-signals and flash and sound telegraphy have also been considered, among them those of Gustin, Geeke, and Brown, and their merits reported upon.

In June a comparison was made of the merits of two methods for night-signaling, the mortar and bomb and the rocket, and an elaborate series of experiments with the latter commenced, which are being continued with a promise of good results.

Work has been steadily going on in the preparation of a new naval general signal-book, and the advanced portions are now in press. It will be ready for issue about the 1st of January.

During the year a careful supervision has been exercised over the signal-departments of the various vessels in the service, as shown in their quarterly reports and returns, required by the circular-order of the Bureau of July 18, 1869. These reports and returns have been regularly made and give evidence of improvement in signaling.

For carrying on the operations of this office during the ensuing fiscal year, the sum of $1,000 will be sufficient for the various items of expense, as follows:

Office-rent	$240
Laborer's wages	549
Contingent expenses	211
Total	1,000

I have the honor to be, very respectfully, your obedient servant,

FOXHALL A. PARKER,
Commodore and Chief Signal-Officer, United States Navy.

Commodore DANIEL AMMEN, U. S. N.,
Chief of Bureau of Navigation,
Navy Department, Washington, D. C.

BUREAU OF NAVIGATION.

Estimate of appropriations required for the service of the fiscal year ending June 30, 1877, by the Bureau of Navigation.

FOR THE SUPPORT OF THE BUREAU OF NAVIGATION.

For salary of chief clerk, (act approved July 5, 1862, section 3)	$1,800
For salary of one clerk of third class, (act of July 23, 1866, section 8, and July 12, 1870, section 1)	1,600
For salary of one clerk of second class, (act of July 23, 1866, section 8, and July 12, 1870, section 1)	1,400
For salary of messenger, (act of July 5, 1862, and proviso of March 3, 1869)	840
For salary of laborer, (act of July 5, 1862, and proviso of March 3, 1869)	720
For contingent expenses	800
Total	7,160

Estimate of appropriations required for the service of the fiscal year ending June 30, 1877, by the Bureau of Navigation.

A.

1.—For Navigation.

For foreign and local pilotage and towage of ships-of-war	$50,000
For services and materials in correcting compasses on board ship and for adjusting and testing compasses on shore	3,000
For nautical and astronomical instruments, nautical books, maps, charts, and sailing directions, and for repairs of nautical instruments of ships-of-war	10,000
For books for libraries of ships-of-war	3,000
For navy-signals and apparatus, namely, rockets, signal-lights and lanterns, including running-lights, and for drawing and engraving for signal-books	6,000
For compass-fittings, including binnacles, tripods, and other appendages of ships' compasses	5,000
For logs and other appliances for measuring the ship's way; for leads and other appliances for sounding	3,000
For lanterns and lamps and their appendages, for general use on board ship, including those for cabin, wardroom, steerage, holds, spirit-room, and for deck and for quartermaster's use	5,000
For bunting and other materials for flags, and for making and repairing flags of all kinds	5,000
For oil for ships-of-war, other than that used in the engineer-department; for candles when used as a substitute for oil in binnacles and running-lights; for chimneys and wicks; and for soap used in the navigation-department	20,000
For stationery for commanders and navigators of ships-of-war and for use of courts-martial	2,000
For musical instruments and music for ships-of-war	1,000
For steering-signals and indicators, and for speaking-tubes and gongs for signal-communication on board ships-of-war	2,500
Total	115,500

2.—For Navigation, Contingent.

For freight and transportation, postage and telegraphing on public business, advertising for proposals, packing-boxes and materials, and all other contingent expenses	4,000

3.—For Navigation, Hydrographic Work.

For drawing, engraving, printing, and photolithographing charts; correcting old plates; preparing and publishing sailing-directions and other hydrographic information; and for making charts, including those of the Pacific Ocean	60,000
For fuel, lights, and office-furniture; care of building and other labor; purchase of books for library; drawing-materials, and other stationery; postage, freight, and other contingent expenses	5,000
For rent and repair of building	2,800
Total	67,800

For one clerk	
For wages of one instrument-maker, three watchmen, one messenger, porter keeping grounds in order, and for repairs of building and inclosures; fuel, light, and office-furniture; purchase of books for library and chemicals for batteries; stationery, freight, and all other incidental expenses	10,000
For continuing theory and tables of the moon's motion	3,000
For reducing and transcribing astronomical observations for publication	2,200
Total	21,500

C.

1.—NAUTICAL ALMANAC.

For pay of computors and clerk for preparing for publication the American Ephemeris and Nautical Almanac	20,000
For rent, fuel, labor, stationery, boxes, expresses, and miscellaneous items	1,500
For continuance of work on new planets discovered by American astronomers	3,000
Total	24,500

RECAPITULATION.

Estimate of appropriations required for the fiscal year ending June 30, 1877, by the Bureau of Navigation, Navy Department.

FOR SUPPORT OF BUREAU.

Salaries and contingent	$7,160

FOR THE NAVAL SERVICE.

A. 1.—Navigation	115,500
2.—Navigation, contingent	4,000
3.—Navigation, hydrographic work	67,800
B. 1.—Naval observatory	21,500
C. 1.—Nautical Almanac	24,500
Total	233,300

No. 5.

BUREAU OF EQUIPMENT AND RECRUITING.

NAVY DEPARTMENT,
BUREAU OF EQUIPMENT AND RECRUITING,
Washington, October 15, 1875.

SIR: I have the honor to submit the following report of this Bureau for the past fiscal year, together with estimates for its support for the fiscal year ending June 30, 1877.

During the past fiscal year 110 vessels have been either partially or wholly equipped under this Bureau at the several navy-yards, at an expenditure of labor and material amounting to $566,221.83.

Two hundred and fifty-three tons of hemp have been purchased, costing $74,151.58. Thirty-nine thousand five hundred and seventy-nine tons of coal have been purchased, at home and abroad, for the use of the Navy, under this Bureau, costing, including freights on shipments, $415,863.53.

The rope-walk at the Charlestown navy-yard has supplied the wants of the service with wire, hemp, manila, and hide-rope.

The equipment-shops at the Washington navy-yard have furnished all the anchors, chains, galleys, &c., needed for the service.

I have respectfully to invite your attention to the frequently overcrowded state of the receiving-ship at the Brooklyn navy-yard; this overcrowding endangers the health as well as the comfort of the recruits, and I would therefore recommend that the hulk Vermont be roofed and fitted up with mess-rooms, dormitories, kitchens, &c., capable of accommodating 600 persons, and be used as a supplement to the receiving-ship when occasion may so require.

A building is now being erected by the Bureau of Yards and Docks on the Cob Dock, to contain both wash and reception rooms for the additional comfort and convenience of the recruits.

This arrangement is urgently recommended as a sanitary measure; during the excitement of 1873, resulting from the threatened disturbance with Spain, the recruits being crowded upon the receiving-ship, without sufficient facilities for their comfort and cleanliness, and almost without shelter, disease of nearly every form appeared among them; sick and discontented, the men either deserted or were drafted for service unfit, from these causes, to perform the duties required of them.

Such a condition of things demands a remedy; aside from the destructive effect upon the efficiency of the Navy, it is disgraceful to the country and a justifiable cause of discontent and its concomitant desertion.

The expense of fitting up the Vermont for this purpose has been included in the present estimate under appropriation, contingent.

Referring to the recommendations of my predecessor in relation to the furnishing enlisted men with an outfit of clothing on entering the service, I would recommend that an allowance for outfit to the amount of $50 be credited to each recruit after three months' service, as an offset to the amount charged to his account for clothing on his entry into the service.

I would also recommend that the provisions of the act of Congress approved May 15, 1872, allowing interest at the rate of 4 per cent. per annum on the savings of soldiers deposited with paymasters, be extended to apply to the amounts due enlisted men in the Navy, and retained until the expiration of their terms of enlistment, under such regulations as the Department shall direct.

Owing to the decrease of commerce under the American flag there has been a growing deficiency of good seamen for the Navy.

This fact, which would become startlingly apparent on any emergency requiring the service of the Navy in time of war, has induced the Department to establish training-ships at the Brooklyn, Kittery, and Mare Island navy-yards, for the purpose of training boys for sailors in the Navy; this has been done without additional cost.

According to law a number of boys have already been enlisted to serve until reaching twenty-one years of age, and a system of training and regulations have been adopted which are believed will secure the end in view. There are 260 of these lads now under instruction, and the reports of their commanding officers exhibit the most satisfactory results. Should the system be extended and made permanent, it is hoped that in a short time the Navy will be manned by intelligent and native-born seamen, and many boys rescued from idle and vicious lives, to enter upon a useful and honorable career.

The *personnel* of the Navy being limited to 8,500 men, the boys already enlisted have been taken from this allowance. I have, therefore, urgently to recommend for your consideration that Congress be asked for the en-

actment of a law authorizing the enlistment of 500 boys in addition, and the furnishing by the Government an outfit of clothing, not to exceed $50 for each boy.

The foregoing projects for the health and comfort of the recruits, and the improvement of seamen in the Navy, are earnestly recommended for your consideration and approval.

The time has come when something besides coercion must be used to improve the *morale* of the Navy; educate the man for the service and give him inducements to remain in it, by consulting his wants, both mental and physical.

The records of this Bureau prove that the fear of punishment does not deter men from deserting; take away the provocation for desertion and this demoralizing crime will diminish; if it then ensues, punish it with the rigor of military law.

The statute-books are full of enactments in favor of the officers of the Navy, but we look almost in vain for any legislation in favor of its seamen.

One or two laws of a negative character—the abolition of flogging and the banishment of the grog-tub—are about the total of the enactments looking to the improvement of the rank and file; the apex of the pyramid has been adorned, but the foundation-stones lie in an inchoate condition, threatening at any time to bring the whole structure to ruin.

There has never within my experience been other than spasmodic efforts made to elevate and enlighten our men, and even these efforts have been rendered futile, either through prejudice or inattention.

The legislation now sought is but a step in the right direction, and is imperatively called for to save the *personnel* of the Navy from complete demoralization.

It is to be hoped that Congress, which provides liberally for the education of the officers, will not refuse to grant the small sums asked for to promote the health and education of the men who form the rank and file, upon whose conduct in time of war depend in equal measure the reputation of the service and the safety of the country, and whose career in time of peace might add so much to the honor of a republican Government.

I am, very respectfully, your obedient servant,

R. W. SHUFELDT,
Chief of the Bureau of Equipment and Recruiting.

Hon. G. M. ROBESON,
Secretary of the Navy, Washington, D. C.

E. & R. No. 1.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1877, by the Bureau of Equipment and Recruiting.

CIVIL SERVICE.

Chief clerk, per act July 15, 1862	$1,800
One clerk, class four, per act July 23, 1866	1,800
One clerk, class three, per act July 23, 1866	1,600
Two clerks, class two, per act July 12, 1870	2,800
Two clerks, class one, per act July 23, 1866	2,400
One messenger, per act July 15, 1862, and July 12, 1870	840
One laborer, per act July 12, 1870	720
	11,960
Appropriated for the fiscal year ending June 30, 1876	11,960

CONTINGENT EXPENSES.

Stationery, books, and miscellaneous items	$850
Appropriated for fiscal year ending June 30, 1876	$850

E. &. R. No. 2.

PAY OF THE NAVY.

For pay of commissioned and warrant officers at sea, on shore, on special service, and those on the retired list and unemployed, and the actual expenses of officers traveling under orders, and for the pay of petty officers, seamen, ordinary seamen, landsmen, and boys, including men of the engineer's force, and for the Coast-Survey service, 8,500 men, at the pay prescribed by law	$7,600,000

NOTE.—This is the amount made up by close computation and examination of the rolls, by both the Fourth Auditor's Office and the Navy Department.

The appropriations for the last three years have been too small to make the payments required by the provisions of existing laws; the deficit has only been made up by the balances of the appropriations for the Navy available by law for this purpose; all these that can be legally used are now exhausted.

Appropriated for fiscal year ending June 30, 1876	6,250,000

E. & R. No. 3.

EQUIPMENT OF VESSELS.

Coal for steamer's and ship's use, including expenses of transportation, storage, and labor; hemp, wire, hides, and other materials for the manufacture of rope; cordage, canvas, leather, and wood; iron for the manufacture of cables, anchors, and galleys; furniture, hose, bake-ovens, cooking and heating stoves; life-rafts for monitors, tools, condensing and boat-detaching apparatus; heating-apparatus for receiving-ships; and for the payment of labor in equipping vessels and manufacture of articles in the several navy-yards	$1,500,000
Appropriated for the fiscal year ending June 30, 1876	1,250,000

E. & R. No. 4.

CONTINGENT.

Expenses of recruiting, fitting up receiving-ships, freights, and transportation of stores; transportation of enlisted men; printing, advertising, telegraphing, books and models, stationery, express-charges; internal alterations, fixtures, and appliances in equipment-buildings at navy-yards; foreign postage, ferriage, and car-tickets; ice; apprehension of deserters; assistance to vessels in distress; good-conduct badges for enlisted men, and engraving continuous-service certificates	$100,000
Appropriated for the fiscal year ending June 30, 1876	75,000

No. 6.

BUREAU OF ORDNANCE.

BUREAU OF ORDNANCE, NAVY DEPARTMENT,
Washington City, September 15, 1875.

SIR: I have the honor to submit the annual report of this Bureau, with accompanying estimates for the fiscal year ending June 30, 1877. These estimates are prepared after a careful consideration—

First, of the current wants of ordnance based upon experience, $560,121; and, secondly, upon improvements necessary to preserve the public property or to diminish the expense of current work, $95,299; torpedo-service, $103,000. To which is added an estimate for rifled cannon, $654,100; total, $1,412,520.

Each of the first two items is considerably larger than the amount appropriated for the current year; but the efficiency of the ordnance-service has suffered by the necessity of working up old and defective material where new should have been supplied.

The estimate for rifled cannon is new, and in its support I submit the following reasons:

RIFLED CANNON.

The experiments which have been made by the Army ordnance at Sandy Hook during the past year have proved the entire practicability of converting the Army 10-inch smooth bore, of about the same weight and general dimensions of the Navy 11-inch, into a powerful 8-inch rifle.

The Bureau, therefore, proposes to commence with the conversion of a sufficient number of the 11-inch to arm the new sloop Trenton and supply pivot guns to the larger frigates.

If we are to keep pace with other maritime nations, the necessity of a general re-armament of our ships with rifled cannon is evident, and so strongly is this impressed upon all commanding officers who meet foreign ships that the Bureau is in constant receipt of reports making depreciatory comparisons between their own and foreign armaments.

Although we can convert the 11-inch pivots into powerful muzzle-loading rifles for upper decks, they are by no means so efficient as new guns specially designed for the purpose, while for broadside guns and small ships, breech loaders are indispensable. I therefore take leave to renew my recommendations of last year relative to obtaining a supply of breech-loading rifles of various calibers.

The twenty 12-inch rifles estimated for form the armament of the five double turreted monitors now in construction, and will take some time to manufacture; not less than a year after the appropriation becomes available, if we engage all the mechanical resources of the country. These vessels are essential to aid in the defense of our most important harbors.

TORPEDOES.

This branch of the ordnance-service is in a very efficient state, and I beg leave to recommend liberal appropriations for its support.

The torpedo is in its nature a defensive rather than an offensive weapon, and is an adjunct to, but can never supply the place of, efficiently armed vessels, even for defense.

All authorities agree in the opinion that torpedoes alone cannot protect themselves or close important harbors; but should be commanded by artillery fire and be supported by monitors, rams, and movable torpedoes.

The defense may be considered then on a good basis, if the monitors are armed as above estimated for.

Our efforts are now principally devoted to developing the offensive use of torpedoes by specially constructed vessels such as the Alarm and Intrepid, by fast steam-launches, and by the movable torpedoes of Lay and Ericsson. Each of these has achieved a considerable success; but all are deficient in speed.

The movable torpedoes of Lay and Ericsson can be submerged and directed from the shore, or a monitor, with great accuracy; and the former for considerable distances; farther, indeed, than is, in my opinion, requisite or useful. Further experiment will, without doubt, develop an increased speed and value.

I recommend an appropriation for the purchase of the "best movable torpedo," to be determined after a competitive trial, as I am of the opinion that invention in this direction is not exhausted.

All cruising ships are fitted with the spar and towing torpedoes, and many officers are well instructed in their use.

Since torpedoes are to play an important part in maritime warfare, I recommend that all officers of and below the rank of captain shall be required to attend the course of instruction, as a knowledge of the preparation and use of torpedoes is now as necessary as of the great-gun drill.

Two officers, Captain McCauley and Commander Kirkland, have voluntarily attended.

DIVERS.

Arrangements are now being perfected for adding to the appliances of the torpedo station a limited number of seamen-gunners, to be instructed in all the details of submarine warfare; especially in the practice of laying torpedoes for defensive purposes, in removing and rendering inoperative those of an enemy, and in work upon obstructions, &c.

In due time it will then be expedient to add one diver to the complement of each ship, who will be also useful for general under water repairs; and no doubt many zealous officers will, as in other navies, obtain certificates as divers.

MAGAZINES.

The magazine at Craney Island has been completed, the powder from Fort Norfolk transferred to it, and the latter place converted into a much needed ordnance depot.

Fifty thousand dollars could be advantageously expended in adding to the facilities of this station for the reception of powder.

I take leave to renew the frequent statements of my predecessors, calling attention to the dangerous proximity of the naval magazine at Ellis Island to the city of New York and Jersey City, and to recommend an appropriation for the purchase of a new site.

I have the honor to be, with great respect, your obedient servant,

WILLIAM N. JEFFERS,
Chief of Bureau.

Hon. GEO. M. ROBESON,
Secretary of the Navy.

UNITED STATES TORPEDO-STATION,
Newport, R. I., October 8, 1875.

SIR: In accordance with orders from the Navy Department dated September 17, 1875, we have to make the following report to the Bureau

of the results of the examination of officers under instruction at this station.

The board met and organized on the 4th instant, and since then have been afforded every facility and assistance in making themselves acquainted with the condition of affairs at the station.

Besides which, through the kindness of Admiral Porter, they were enabled to witness the extraordinary performance of the torpedo-boat Alarm; and although this is not included in the authorized subjects of this report, they desire to express their high appreciation of the results obtained in the application of modern scientific discoveries to the purposes of naval warfare.

The following programme, arranged by the commanding officer of the station, was substantially followed:

One day for chemistry.
One day for electricity and fuses.
One day for torpedoes.
Two days for practical exercises and such arrangements as the board of visitors may desire.

During the time devoted to the latter feature of the examination, the board had the pleasure of witnessing experiments with service-torpedoes from the Nina while under way, as also the firing of standard and exercise torpedoes from steam and rowing launches.

The operation of both the Ericsson and Lay torpedoes, in presence of the board, proved highly interesting.

The proficiency shown by the class of officers under instruction here for the short space of only four months is, in our opinion, ample warrant for the wisdom of the course adopted in establishing this institution, while their familiarity with and dexterity in the practical use of torpedoes are of inestimable benefit to the service.

The board would recommend as great an extension of the system (so far as the number of officers to be instructed is concerned) as is practicable.

The benefits of the establishment are further and more fully demonstrated by the very valuable inventions and improvements made by post-graduates of the station, in torpedoes, electrical devices, and practical applications of other known appliances to the uses of the service.

The board would recommend that a frigate's steam-launch, fully fitted for service, be furnished to the station, and if possible, a larger vessel of great speed; both of which are eminently essential for the full development of the objects of the institution.

They would further recommend the construction of a sea-wall on the west side of the island, to prevent the progressive washing away of that portion of the grounds, which is of great value and has already been seriously encroached upon and reduced.

We are, sir, very respectfully,

A. M. PENNOCK,
Rear-Admiral and President.
WM. G. TEMPLE,
Captain U. S. N.
GEO. BROWN,
Commander U. S. N.
J. D. MARVIN,
Commander U. S. N.

Commodore WILLIAM N. JEFFERS, U. S. N.,
Chief of the Bureau of Ordnance, Navy Department.

UNITED STATES TORPEDO-STATION,
Newport, R. I., October 9, 1875.

SIR: I have to report that the board of visitors were received at the station on the 4th instant by all the officers, and a subaqueous salute of thirteen torpedoes of ten pounds of powder each was fired.

There were submitted to the board the following papers:

No. 1.—Extract of the Bureau's order of June 7, setting forth what was required of the officers under instruction.

No. 2.—Programme of studies as prepared by Captain Simpson and approved by the Bureau.

No. 3.—Inclosed. The order of the day to govern the examination.

No. 4.—Inclosed. Questions in chemistry.

No. 5.—Inclosed. Questions in electricity.

No. 6.—Inclosed. Questions in fuses.

No. 7.—Inclosed. Questions in torpedoes.

On Monday the questions on chemistry and explosives were given to the class. After having been answered in writing, and corrected by the instructor, and indorsed as to general character, they were submitted to the board.

On this day the board went out on the Alarm with Admiral Porter.

Tuesday was given up to practical exercises and witnessing the Ericsson torpedo perform, under Mr. Lassoe's direction.

The practical exercises were as follows:

Each section of the class fitted and fired a 100-pounder spar torpedo from the Nina, at full speed.

Fitted and towed the Harvey torpedo, making it dive, &c., all service-fittings.

The junior section fitted and fired two 75-pounder boat-torpedoes from the steam launch, service fittings.

Each officer of the senior section fitted and fired an exercise-torpedo from the rowing-launch, using their own fuses.

All this was done in the presence of the board, as examples of the knowledge of the class of the practical working of the service torpedoes.

The Ericsson torpedo worked rather stiffly at first, but after a few trials performed in its usual manner, to the gratification of the board.

Wednesday the class had questions in electricty and in fuses given them, which, after having been answered, corrected, and indorsed, as were the questions in chemistry, were submitted to the board.

This day the board made a tour of the island, with the view of informing themselves of the facilities of the station for instruction and for supplying the wants of the service.

Thursday was occupied by the class on the questions on torpedoes, which, after having been completed, were treated as those given above.

On Monday afternoon the board made a special request to have the Lay boat run.

All the electric part had been removed to show the class in detail, and, from previous work on the boat, it was considered hardly possible to be able to exhibit the boat on Thursday, which was the day appointed by the board.

The order was given to prepare in the morning of the next day, Tuesday.

By Tuesday night all the gas was made, and on Wednesday afternoon the boat was tried and ready for work. This was due to the personal attention of Lieutenant Bradford and Professor Hill.

On Thursday at noon, the time appointed by the board, the boat was tried, and it was decidedly the most successful that I have witnessed.

Admiral Pennock and Commander Brown worked the boat at will after it had been shown by Lieutenant Bradford.

Friday, the board stating that they were satisfied with the exhibition made by the officers under instruction, the detachments were given them, and they left the station.

I beg leave to express my opinion that the class will compare favorably with the previous class in point of knowledge, and that, although the usual amount of feeling has been displayed against the course pursued here, yet no one of the class seems to have thought it of importance enough to express his opinions on what would add to the efficiency of the station, for instruction, though invited to do so by the board.

The board dissolved at noon.

Very respectfully,

K. R. BREESE,
Captain, Inspector of Ordnance, in charge of Station.

Commodore WM. N. JEFFERS, U. S. N.,
Chief of the Bureau of Ordnance.

The examination of officers under instruction will commence on Monday, the 4th of October.

The hours of attendance will be from the arrival of the 9.30 a. m. boat until 4 p. m., unless otherwise changed by the desire of the board.

One day will be assigned to chemistry.

One day to electricity and fuses.

One day to torpedoes.

Two days to practical exercises and such other arrangements as the board of visitors may desire.

Examinations will be written.

Questions will be submitted in groups, only one in a group being required to be answered.

Each member of the class will be allowed the use of his own notebook, which is to be submitted to the board, for inspection, at the close of the examination.

On the completion of the paper of the day, each member of the class will take his paper to the officer of the day for the commanding officer, who will submit it to the instructor in whose department the subject belongs for remark.

The papers will then be laid before the board for their judgment.

The following rooms are assigned for examination rooms, with the below detail for each room:

Library.—Lieutenant-Commander Higginson, Lieutenant-Commander F. Wildes, Lieut. Commander C. F. Schmitz, Lieut. Commander B. P. Lamberton, Lieut. Commander G. F. F. Wilde.

Chemical laboratory.—Lieut. Commander C. H. Davis, Lieut. Commander J. Bishop, Lieutenant-Commander Kingsley, Lieutenant-Commander Randall, Lieutenant-Commander Bicknell.

Electrical laboratory.—Lieutenant Swinburne, Lieutenant McIlvaine, Lieutenant Niles, Lieutenant Davenport, Master Dillingham.

Uniform: Blue undress.

The officers will be notified of the time for the reception of the board, and will be present with the officers of the station.

K. R. BREESE,
Captain U. S. N., and Inspector of Ordnance Commanding.

Questions for examination in Chemistry.

1.

1. Difference between physical and chemical changes. Give example.
2. Analysis and synthesis. Give example of complete analysis and synthesis of some compound.
3. Define atom and molecule.

2.

1. What is an explosive reaction as distinguished from other chemical changes?
2. Define explosion and explosive effect.
3. What is an explosive agent?

3.

1. Causes of the explosive character of a reaction, and the manner in which they influence the effect produced.
2. Circumstances of explosion, and their influence on the explosive reaction.

4.

1. Detonation.
2. Modes of producing detonation.
3. Comparative value of detonation.

5.

1. General composition of explosive agents.
2. Difference between explosive compounds and explosive mixtures.
3. Similarity of chemical constitution of explosive agents.

6.

1. Composition and properties of glycerine.
2. Composition of cellulose. Where is it found?
3. Difference between explosive gun cotton and gun cotton.

7.

1. Chemical constitution of nitro-glycerine.
2. Reaction by which nitro-glycerine is produced.

8.

1. Materials used and mode of manufacture of nitro-glycerine.
2. Properties of nitro-glycerine; mode of firing it, and products of its decomposition.

9.

1. General characteristics of nitro-glycerine preparations.
2. Manufacture of dynamite, and its properties.
3. Other nitro-glycerine preparations.

10.

1. Chemical constitution of gun cotton.
2. Reaction by which gun cotton is produced.
3. Different forms of gun cotton.

11.

1. Process of making long stapled gun cotton.
2. Process of making compressed gun cotton.

12.

1. Properties of and modes of firing gun cotton.
2. Relative force and products of the decomposition of gun cotton.
3. Gun-cotton preparations.

13.

1. Chemical constitution and properties of the picrates.
2. Picric powder; composition, &c.

14.

1. Mode of making fulminating mercury.
2. Chemical constitution, properties, and uses of fulminating mercury.

15.

1. General composition of explosive mixtures.
2. Classes of explosive mixtures, and characteristics of each class.

16.

1. Materials used in making gunpowder; their chemical relations; their properties, and the modes of preparing them for use.
2. Processes of the manufacture of gunpowder.

17.

1. General or average composition of gunpowder. Why is this the best possible mixture of such ingredients?
2. Show that the effect obtained from the explosion of gunpowder is affected by the mode of firing.

18.

1. Effect of variations in the charcoal on the character of gunpowder.
2. Products of explosive decomposition of gunpowder.
3. Mechanical work and pressure exerted by gunpowder.

19.

1. Modes of varying mechanical condition of gunpowder, in order to obtain different effects.
2. Kinds of gunpowder of regular shape in use, and the methods of preparing them.

20.

1. Compare the properties of the various explosive agents in regard to their use in torpedoes.
2. Generally speaking, what explosive agents are best for torpedoes? Give reasons.

21.

1. Relative force exerted by different explosives.
2. What is the "primer" for large charges of gun cotton?

22.

1. What governs the size of a torpedo charge?
2. Charges used in spar and movable torpedoes?
3. Charges used in ground torpedoes?

23.

1. Relation between the sizes of charges in ground torpedoes and the system of defense to which they belong.
2. What is meant by the "radius" of explosive effect?

24.

1. Use of explosive agents to remove torpedoes or obstructions.
2. Distances which must be allowed between permanent mines.
3. Effect of depth on horizontal effective distance.

List of questions in Electricity.

1.

What is required in a source of electricity for use in defensive operations, and why do you select a galvanic battery for this class of operations?

What is required in a source of electricity for use in offensive operations?

2.

Describe the station battery; liquids used; method of preparing it its advantages.

Describe care of batteries.

For what purpose would you use the station battery in torpedo operations?

Describe the gravity battery; liquids used; method of setting it up; its advantages; care of it.

For what purpose would you use it in torpedo operations?

3.

Describe Farmer's A. machine, (excluding firing key.)

Describe Farmer's C. machine.

4.

Give Gavarret's formulæ.

Describe the firing key for the A. machine, and explain the electrical principles on which its working depends.

What are the electrical dimensions of a battery?

In what ways may battery-cells be arranged?

Give the formulæ for computing the resulting strength of current for the various combinations, and state what should guide you in the arrangements of any number of battery cells, in any particular case, in order to get the greatest strength of current possible.

5.

How do you measure the E. M. F. of a battery?

How its resistance?

How do you measure the resistance of a conductor?

Describe Wheatstone's bridge and demonstrate its formulæ.

6.

Why is the platinum wire fuse adapted to Farmer's machine, and why will Farmer's machine, when this fuse is used, fire through leaky wires? Why will not the Wheatstone machine fire through leaky wires?

Show why, in using the firing key to Farmer's machine, it is better to press first the (firing) key F, and then the (testing) key T.

List of questions on Fuses.

1.

1. Electric fuses, define and state different methods of causing ignition.
2. What material would you use for the bridges of fuses which are to be fired by M. E. machines, D. E. machines, voltaic batteries?

2.

3. Service fuse; describe, giving sketch of sections.
4. Describe method of measuring resistance of service-fuse, giving sketch of apparatus used.

3.

5. Describe process of manufacturing service D. E. igniter wooden cases.
6. Describe process of manufacturing D. E. igniter copper cases.

4.

7. Improvised fuses; Lieutenant Bradford's plan; describe, giving sketch; state with what sources of electricity it can be fired.
8. Improvised fuses; Lieutenant Barber's plan; describe, giving sketch; state with what sources of electricity it can be fired.

5.

9. Improvised fuses; Lieutenant Moore's plan; describe, giving sketch; state with what sources of electricity it can be fired.
10. Improvised fuses; Lieutenant Pillsbury's plan; describe, giving sketch; state with what sources of electricity it can be fired.

6.

11. Given, wires of different materials, state how you would determine the proper length of bridge to be used to fire with Farmer's machine.
12. Describe the M. E. igniter, and mention in what it principally differs from the platinum wire fuse.

List of questions on Torpedoes.

1.

1. Describe the regulation spar and fittings for the use of the spar torpedo, as furnished ships in commission, giving dimensions and mode of using.
2. Describe the regulation spar and fittings for boats, giving dimensions, &c., and how used.

2.

3. Describe English method of fitting boats for spar torpedoes.
4. Describe Danish method of fitting boats for spar torpedoes.

3.

5. Describe how a torpedo spar and the necessary fittings may be improvised on board ships in the absence of the regular fittings supplied at navy yards.
6. Describe how the above may be fitted to a boat or launch.

4.

7. Describe the most approved form of "monitor" fittings for spar torpedoes.
8. Describe the most approved form of fittings for tugs, and where should spar be placed?

5.

9. Describe the manner of placing reels for Harvey torpedoes.
   How should they revolve?
   How are the tow-ropes and safety pin lines led?
   Where are snatch-blocks placed?

What is the most convenient way of launching a Harvey, and precautions to be observed while doing so?

10. Describe the manner of leading permanent wires, and mode of using switches for connecting them for firing spar torpedoes in connection with firing-key, such as fitted in the Tennessee.

6.

11. Describe the manner of filling fusing and preparing for use the spar torpedo; precautions to be observed in placing and lashing on the socket.

12. Describe the manner of preparing the Harvey torpedo for use, including filling, preparing priming case, placing firing-bolt and safety-pin, and stopping safety-pin line.

Number of buoys, length of buoy-rope, and pressure firing-bolt should have to force it down.

7.

13. Describe in detail the construction of the Harvey firing-bolt.

14. Describe in detail the construction of the sensitive primer and its case, as used at the station.

8.

15. How improvise a torpedo for exercise, or for service in blowing up hulks, or to be used as a ground torpedo, from materials on board ship, having only the usual torpedo outfit.

Best fuse connections for this purpose; precaution to be observed in regard to the cases.

16. What is the horizontal distance and immersion necessary to insure safety from flying pieces, and damage to ships, when exploding 100-pounder service torpedoes.

Same for 75-pounders.

What kind of powder is now used for all service torpedoes?

9.

17. How connect a large number of fuses to fire simultaneously?

What accident may happen while using Farmer's machine to cause failure to fire?

How fire a torpedo with Farmer's A machine without a firing-key?

18.—How test Farmer's machine, firing-key, cables, and fuses?

When is it necessary to use two wires, instead of one wire, and an earth, when firing torpedoes?

Difference in the practical use of Farmer's A and C machines.

10.

19.—Give tactics to be observed in using spar torpedoes offensively and defensively.

20.—Give tactics to be observed in using Harvey torpedoes offensively and defensively.

11.

21.—Describe the Lay torpedo and manner of using it.

22.—Describe the Whitehead torpedo and manner of using it.

12.

23.—Describe the Barber towing torpedo and manner of using and firing it.

24.—Describe the Danish towing torpedo and manner of using and firing it.

13.

25.—Describe in detail what instruction should be given to officers and men in order to familiarize them with the spar torpedo, its attachments and fittings, such as are now furnished to cruising-ships, and manner of using them.

26.—The same for the Harvey torpedo outfit as furnished to cruising-ships.

A.

1.—Enumerate the different methods of ascertaining the position of a ship with regard to any particular torpedo, in a system of stationary or ground torpedoes.

2.—Explain different methods of leading the wires and firing the torpedoes, in a system of ground torpedoes, when the position of the vessel is to be determined by cross-bearings.

B.

1.—What advantages does an electro-contact system of ground torpedoes possess over the different non-contact system?

2.—Name the different kinds of contact apparatus which can be used in systems of electro-contact torpedoes.

C.

1.—In using electro-contact apparatus, under what circumstances would you place it in the torpedo, and under what circumstances would you place it in a detached buoy?

2.—What is the distinguishing characteristic of a "circuit-closer," and how would you connect one to the circuit of a ground torpedo?

D.

1.—What is the distinguishing characteristic of a "circuit-breaker," and how would you connect one to the circuit of a ground torpedo.

2.—What is the distinguishing characteristic of a "circuit-shunt," and how would you connect one to the circuit of a ground torpedo.

E.

1.—Give a general descrption of the Ericsson torpedo.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1877, by the Bureau of Ordnance, Navy Department.

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1876.
SALARIES.		
Chief clerk, per act of July 23, 1866, (14 Stat. at L., p. 204, sec. 8)	$1, 800 00	
Draughtsman, per act of March 2, 1867, (14 Stat. at L., p. 450, sec. 1)	1, 800 00	
One clerk of class three, per act of July 12, 1870, (16 Stat. at L., p. 249, sec. 1)	1, 600 00	
Two clerks of class two, per act of July 12, 1870, (16 Stat at L., p. 249, sec. 1)	2, 800 00	
One messenger, per acts of July 5, 1862, (12 Stat. at L., p. 511, sec. 3,) and March 3, 1869, (15 Stat. at L., p. 287, sec. 1)	840 00	
One laborer, per act of July 12, 1870, (16 Stat. at L., p. 250, sec. 3)	720 00	
Total	9, 560 00	$9, 560 00
CONTINGENT EXPENSES.		
Stationery, books, and miscellaneous items, (appropriated, act of March 3, 1875)	800 00	800
ORDNANCE AND ORDNANCE STORES.		
Fuel, tools, and material of all kinds necessary in carrying on the current daily work of mechanical branches of the ordnance department of the several navy-yards, magazines, and stations, (appropriated, act of January 18, 1875)	$100, 000 00	
Labor at the several navy-yards, magazines, and stations in fitting ships for sea, and in preserving ordnance material, (appropriated, act of January 18, 1875)	250, 000 00	
Necessary repairs to ordnance buildings, magazines, gun-parks, boats, lighters, wharves, machinery, and appendages, (appropriated, act of January 18, 1875)	25, 000 00	
NOTE.—For several years this appropriation has been so much reduced, that the buildings and wharves, which are necessarily in exposed situations, are becoming much dilapidated.		
Miscellaneous items, to wit: Freight to foreign and home stations; advertising and auctioneers' fees; cartage and express charges; repairs to fire-engines; gas and water-pipes; gas and water tax at magazines; toll, ferriage, foreign postage, telegrams, &c., (appropriated, act of January 18, 1875)	10, 000 00	
NOTE.—This is based on the experience of several years, and is necessary for the efficiency of the service.		
Experiments in ordnance at naval experimental battery and navy-yard, Washington, (appropriated per act 17 R. S., p. 549)	15, 000 00	
Total	400, 000 00	340, 000 00
TORPEDO CORPS.		
Purchase, manufacture, and preservation of gunpowder, nitro-glycerine, gun-cotton, &c., (appropriated, act of January 18, 1875)	12, 000 00	
Purchase and manufacture of electrical apparatus, galvanic batteries, and insulated wire, (appropriated, act of January 18, 1875)	15, 000 00	
Purchase of copper, iron, wood, and other materials necessary for the manufacture of torpedoes and for work on the same, (appropriated, act of January 18, 1875)	27, 000 00	
Construction of torpedo-boats, purchase of copper work, hulks, and contingent expenses, (appropriated, act of January 18, 1875)	28, 500 00	
Labor, including one chemist, pyrotechnist, electrician, one foreman, machinist, and one writer, (appropriated, act of January 18, 1875)	15, 000 00	
Repairs to buildings and wharves, and material and labor for sea-wall, (appropriated, act of January 18, 1875)	3, 500 00	
Freight and express charges, (appropriated, act of January 18, 1875)	1, 000 00	
Total	102, 000 00	93, 000 00
CONTINGENT.		
Contingent expenses of the ordnance service of the Navy, (appropriated, act of January 18, 1875)	1, 000 00	1, 000 00

No. 7.

BUREAU OF MEDICINE AND SURGERY.

NAVY DEPARTMENT,
BUREAU OF MEDICINE AND SURGERY,
November 1, 1875.

SIR: Herewith I have the honor to submit the annual report of this Bureau, together with estimates for the support of the medical department of the Navy, for the fiscal year ending June 30, 1877.

NAVAL HOSPITALS.

The amount appropriated under head of "Repairs and Improvements of Hospitals," for the fiscal year which expired on the 30th of June last, was so small that repairs only of the most urgent kind, or those indispensable to the preservation of the buildings from deterioration, have been possible. Since the commencement of the current fiscal year, however, a more liberal sum has become available, and strenuous efforts are now making to put them in good condition.

1. The small building occupied as sick-quarters at the Navy Yard, Portsmouth, N. H., has fallen into such a state of dilapidation from age, that no amount of repairs, however judiciously done, can render it habitable much longer. At best it offers but the poorest sort of accommodations for five or six patients. It is my decided opinion that it should be abandoned without delay, and a suitable hospital of the pavilion style erected on land now belonging to the Government, beyond the limits of the yard. Provision of some kind must necessarily exist on the station for the reception and care of cases of an acute or temporary character, and especially of injuries and wounds. Chronic cases of disease and those admitting of transportation may continue to be sent to the hospital at Chelsea, Mass. A ward large enough to accommodate ten or twelve patients would answer all purposes and could be constructed at a small cost.

2. Under the limited appropriation of last year the Chelsea hospital has received only the most necessary repairs, but with the more ample means at the disposal of the Bureau for the present year, considerable progress has been made of late toward placing it in reasonably good order.

3. The New York hospital has been put in as satisfactory condition as our resources would permit, but still falls below what the principal establishment devoted to the care of the sick and wounded of the Navy should be. During the remainder of the fiscal year a large amount of repairs will be needed, but fortunately they can be effected with the funds now available to the Bureau, although nothing will be left for those accessory improvements which are usually considered indispensable in civil institutions of the same kind. The central situation and large capacity of this hospital require that it be kept, at all times, prepared for every demand that may be made upon its resources.

4. The steam-heating apparatus of the naval hospital at Philadelphia has recently been thoroughly repaired, and will now last a long time without calling for further expenditures. The outer wood-work of the building having been found to be suffering from exposure to the weather, is undergoing the process of repainting, and the roof, which was beginning to leak, has also been overhauled and repaired. These

much-needed improvements will contribute greatly to the comfort of the inmates as well as to the durability of this handsome structure.

5. The hospital at Washington is organized on the smallest possible scale, and not a dollar has been expended upon it beyond what was required for unavoidable repairs. It draws its supply of patients from the navy-yard and marine barracks, besides opening its wards for the reception of officers of the Navy who may be taken ill while temporarily sojourning at the capital. Though of restricted dimensions it has proved adequate for all our wants, and as long as it is the policy of the Department to maintain a navy-yard and marine barracks at this station, I do not see how an establishment of the kind can be dispensed with.

6. The hospital at Annapolis was designed for the sick of the Naval Academy and the practice-ships connected therewith. It is a much larger building than is needed for present purposes, and in time of peace will probably never be filled. Its service has been reduced to the minimum standard, and no expenditure allowed which was not required to protect the building from the action of the elements. It is now in very fair condition, and with present appliances is capable of providing for all the sick likely to seek its sheltering care. As the cadet-midshipmen and officers of the academy, with the marines and crews of the vessels attached to the station, amount to between five and six hundred persons, in the event of an epidemic breaking out it is obvious how desirable it might be to possess so commodious an establishment, where no hospital or infirmary exists within the limits of the adjoining town. As this hospital was built and paid for out of the naval-hospital fund, and therefore without cost to the Government, such a possibility should not be overlooked when deliberating on the propriety of alienating this handsome and substantial building. Moreover, if sold, the proceeds would revert to the naval-hospital fund, and not be covered into the National Treasury.

7. During the past year every effort has been made to keep the hospital at Norfolk in the best possible condition, but, for the reason already stated, our means were only sufficient for the performance of those repairs without which the building would have ceased to be habitable. From its situation and accessibility this is one of our most valuable establishments for the care of the sick, and, though very capacious, is, nevertheless, liable at any time to have its resources subjected to the severest strain. When driven from the Gulf of Mexico or West Indies by the prevalence of yellow fever or for the purpose of refitting, the vessels of that large squadron usually resort to Norfolk as the most convenient port of refuge, and generally bring with them large numbers of invalids to people its spacious wards. Vessels ordered to this port from other stations also furnish their quota of sick, and materially add to the demands made on this fine establishment. Hence the importance of always maintaining it in a state to meet these emergencies, which are at once unavoidable and incapable of being anticipated. The appropriation available since the commencement of the present fiscal year has permitted the application of a considerable sum to repairing and improving this hospital, and it is further proposed, while withholding as far as practicable expenditures from other hospitals, to place it on the best footing commensurate with our means.

8. Since my last report, the old infected hospital in the navy-yard, Pensacola, has been demolished, and in its stead a medium-sized pavilion erected on the grounds of the old naval hospital, near Fort Barrancas, by the Bureau of Yards and Docks, on plans prepared by this Bureau. Some delay in furnishing it has arisen from the prevalence of

fever in that vicinity, but this difficulty will soon cease, and it is intended before winter sets in to have the hospital thoroughly equipped for the reception of patients, fifty of whom, on an emergency, can be accommodated, although at present it is not deemed expedient to provide for more than half that number. In the event of a large force being concentrated at any time in the Gulf, an establishment of this kind would be of the first importance. Had it existed last year when the yellow fever prevailed so fatally at the navy-yard and in the adjacent towns, valuable lives might have been saved, or, at least, needless suffering spared to our officers and seamen when stricken by the pestilence.

9. The hospital at Mare Island, Cal., is so rapidly assuming the proportions of a first-class establishment that last quarter its reports showed a larger number of sick than any other, not excepting the large hospital at New York. Its wards are replenished, not only from the two squadrons of the Pacific, but periodically considerable detachments of invalids are received from the Asiatic squadron, and with the assumed prospective increase of our forces in the East the numbers will increase. The importance of this hospital cannot, therefore, well be overrated. All the medical officers, from the absence of quarters outside, are compelled to live within its walls, and, in the very possible event of crowding, the space that should be devoted to the use of the sick might be inconveniently curtailed. A suitable house should be built for the medical director in charge, and a special estimate for this purpose is respectfully submitted. I also renew the recommendation, made in my last report, of an appropriation for certain much-needed works, therein enumerated, looking to the improvement of the hospital and its surroundings.

NAVAL LABORATORY.

Since my last report I regret to say that the Naval Laboratory has been deprived, by death, of the valuable services of its late head, Medical Director A. A. Henderson, U. S. N. Under his successor it continues to fulfill its important function of furnishing an ample supply of pure medicines and superior surgical instruments to the Navy.

LIBRARIES.

I beg to renew the recommendation of a former report, that a small sum be appropriated for the purchase of books, periodicals, and newspapers for the use of patients in our naval hospitals. The want of such means for whiling away the tedious hours of sickness and convalescence has long been felt, but can be supplied at a moderate expense. A similar want of professional works for reference and study by the medical officers attached to these establishments also exists, and cannot be remedied by the means at the disposal of the Bureau. A hospital without a medical library, I need hardly say, is an anomaly in the history of such institutions, and yet a score or two of volumes at each of our naval hospitals constitute their only claim to the possession of what is everywhere regarded as an essential portion of hospital outfit and equipment. It is true the deficiency is supplied to a certain extent by the private collections of these officers themselves, but their necessarily restricted means, as well as the exigencies and vicissitudes of naval life, make this a very inadequate reliance, besides imposing upon them an expense which the Government itself manifestly should bear. Our medical officers ought not to be allowed to retrograde from want of access to the best modern authorities, and it is only those familiar with

the prolific character of the medical press at the present day who can comprehend how far its productions are above the resources of any private purse.

QUARANTINE AT PENSACOLA.

The sanitary regulations adopted by your authority at Pensacola have been so stringently enforced during the present season that the result should be a subject of congratulation to the Department. Notwithstanding the general prevalence of yellow fever in that vicinity, the navy-yard and adjacent towns of Warrington and Woolsey have enjoyed perfect immunity from the disease; while the few cases which have occurred in persons belonging to the Navy were confined to the marines doing picket-duty near Fort Barrancas, where yellow fever has been prevailing with great virulence. For this gratifying state of things too great praise cannot be accorded to Commodore George H. Cooper, commandant of the navy-yard, and Acting Assistant Surgeon William Marlin, who was specially intrusted with the maintenance of the quarantine. Although it may be too early in the season to assert positively that all danger of infection has passed away, there is good reason to hope so, and at all events we should be thankful for the immunity thus far vouchsafed us.

NAVAL HOSPITAL FUND.

In the estimates herewith submitted is the sum of $100,000 to be appropriated to the naval hospital fund. Should it not be deemed feasible to augment the fund in this way, I venture to suggest the expediency of raising the interest of the naval pension fund from 3 per centum (at which rate it is now invested in Government bonds) to 6 per centum, and that the sum of $100,000 accruing from the increase of interest be annually set over to the credit of the naval hospital fund. The naval pension fund, which at present represents a capital of $14,000,000, no longer yields at 3 per centum sufficient for the payment of naval pensions, the deficit last year amounting to $75,000, which was made good by a special appropriation. At 6 per centum the income would be equal to the liquidation of all pension claims, besides leaving a handsome balance, of which a portion might be made available for transfer to the naval hospital fund. Although the fund in question, as its name implies, was originally instituted, and has ever since been sacredly held, for the payment of pensions to disabled officers, seamen, and marines of the Navy, when more than sufficient for this purpose, there appears to be no violation or evasion of law in applying the surplus to those objects for which the congenerous fund was also established. The eleventh section of the "Act for the better government of the Navy of the United States," approved July 17, 1862, seems to leave no room for doubt on this point. It is in these words, viz:

> That all money accruing or which has already accrued to the United States from sale of prizes, shall be and remain forever a fund for the payment of pensions to the officers, seamen, and marines who may be entitled to receive the same; and if the said fund shall be insufficient for the purpose, the public faith is hereby pledged to make up the deficiency; but if it should be more than sufficient, the surplus shall be applied to the making of further provision for the comfort of the disabled officers, seamen, and marines.

It is difficult to conceive any disposition of such surplus that would more effectually conduce to the further comfort of disabled officers and seamen, than its merger in another fund exclusively devoted to the promotion of their welfare in those hospitals to which so many of both classes habitually resort.

For the further augmentation of this fund, I would recommend that hospital money, which is now deducted from the pay of every person in the Navy at the rate of 20 cents per month, be increased to 40 cents, as was done by law a few years ago with the sailors of the merchant marine. This deduction from the wages of seafaring men was first authorized by the act of March 2, 1799, and applied alike to those of the Navy and the merchant service. By the act of February 26, 1811, the two were separated, and the hospital money of the former transferred to a new fund styled the "naval hospital fund." The recent doubling of hospital money in the merchant marine was based on the enormous increase of all values during the past three-quarters of a century, more particularly within the last few years; and the same considerations which led to the change in that branch of the maritime service apply with equal force to the Navy.

PUBLICATION.

A work embracing sanitary reports and reports on the ventilation of ships of war, will soon be ready for publication. As it contains a large body of facts and observations, not only in regard to the hygiene of the vessels themselves, but also with reference to countries and ports visited by them in various quarters of the world, it is not doubted that it will be found highly useful for reference by commanding as well as medical and other officers. The information thus condensed in its pages has been collected in the ordinary course of naval duty, and appears in its present form without other expense to the Government than that of printing and binding.

Very respectfully, your obedient servant,

J. BEALE,
Surgeon-General U. S. N.

Hon. GEORGE M. ROBESON,
Secretary of the Navy.

A.—*Annual statement compiled from sick reports from naval stations and vessels in commission on home and foreign service for the year ending December* 31, 1874.

Hospitals.	Remaining December 31, 1873.	Admitted in 1874.	Discharged in 1874.	Died in 1874.	Total treated in 1874.	Remaining December 31, 1874.	Percentage of deaths to whole number treated.
Chelsea, Mass	25	94	100	1	119	18	.....
Brooklyn, N. Y	83	406	434	16	489	39	.....
Philadelphia, Pa	26	143	130	20	169	19	.....
Annapolis, Md	3	32	29	1	35	5	.....
Washington, D. C	16	111	104	2	127	21	.....
Norfolk, Va	18	317	310	6	335	19	.....
Pensacola, Fla	3	82	62	18	85	5	.....
Mare Island, Cal	54	198	179	12	252	61	.....
Yokohama, Japan	3	66	52	4	69	13	.....
Total	231	1,449	1,400	80	1,680	200	.04

Yards and stations.	Remaining December 31, 1873.	Admitted in 1874.	Discharged in 1874.	Died in 1874.	Total treated in 1874.	Remaining on the sick-list December 31, 1874.	Percentage of deaths to whole number of cases treated.
Portsmouth, N. H	5	93	89	.....	98	9	.....
Boston, Mass	.....	80	75	2	80	3	.....
Brooklyn, N. Y	11	146	150	.....	157	7	.....
Philadelphia, Pa	4	296	298	1	300	1	.....
League Island, Pa	.....	21	20	.....	21	1	.....
Washington, D. C	13	448	450	5	461	6	.....
Norfolk, Va	.....	148	147	.....	148	1	.....
Pensacola, Fla	.....	3	3	.....	3	.....	.....
Mare Island, Cal	12	131	141	.....	143	2	.....
Torpedo station	3	36	38	.....	39	1	.....
Naval Academy	10	785	787	1	795	7	.....
Total	58	2,187	2,198	9	2,245	38	.004

Receiving-ships.	Average number on board in 1874.	Remaining December 31, 1873.	Admitted in 1874.	Discharged in 1874.	Died in 1874.	Total treated in 1874.	Remaining on the sick-list December 31, 1874.	Percentage of deaths to whole number of cases treated.
Portsmouth, N. H	63	1	37	38	.....	38	.....	.....
Boston, Mass	188	9	119	127	1	128	.....	.....
Brooklyn, N. Y	559	31	328	354	2	359	3	.....
Philadelphia, Pa	140	14	109	118	2	123	3	.....
Norfolk, Va	191	.....	39	32	2	39	5	.....
Mare Island, Cal	249	3	183	161	.....	186	25	.....
Total	1,390	58	815	830	7	873	36	.008

Summary of vessels in commission.

Average number of persons on board during the year 1874	13,870
Remaining sick December 31, 1873	322
Admitted in 1874	9,673
Discharged in 1874	9,693
Died in 1874	64
Total treated in 1874	9,995
Remaining sick December 31, 1874	238
Percentage of cases to whole number on board	0.69
Percentage of deaths to whole number on board	0.04
Percentage of deaths to whole number of cases treated	0.004

RECAPITULATION.

	Aggregate number of officers and men on board of vessels in 1874.	Remaining sick December 31, 1873.	Admitted in 1874.	Discharged in 1874.	Died in 1874.	Total treated in 1874.	Remaining sick December 31, 1874.	Percentage of cases to number of persons on board.	Percentage of deaths to number of persons on board.	Percentage of deaths to number of persons treated.
Hospitals	.....	231	1,449	1,400	80	1,680	200	.....	.....	.04
Navy-yards and stations	.....	58	2,187	2,198	9	2,245	38	.....	.....	.004
Receiving-ships	1,390	58	815	830	7	873	36	.62	.005	.008
Vessels in commission at sea	13,870	322	9,673	9,693	64	9,995	238	.69	.004	.004
Total	15,260	669	14,124	14,121	160	14,793	512	.96	.01	.01

At the close of the year 1873 there remained under treatment 669 cases; during the year 1874 there occurred 14,124 cases of disease, injury, &c., making a total of 14,793 cases treated during the year; of which number 160 died, 14,121 were returned to duty or discharged the service, leaving 512 cases under treatment at the close of the year 1874.

The average strength of the Navy, (officers, seamen, marines, engineer service, and coast survey included,) for the year 1874, as near as can be ascertained, was about 15,260.

The percentage of cases admitted, to the whole number of persons in the service, was about .96, or each person was on the sick-list $\frac{96}{100}$ of a time during the year. The percentage of deaths to the whole number of persons in the service was .01, and the percentage of deaths to the whole number of cases treated was .01.

The total number of deaths, from all causes, reported at the Navy Department from October 1, 1874, to September 30, 1875, was 162.

B.—*Summary of prevalent forms of disease on home and foreign service for the year ending December 31, 1874.*

	North Atlantic.		South Atlantic.		European.		Pacific.		Asiatic.		Special service.		School and practice.		Coast survey.		Total.	
Aggregate number of men	6,652		707		1,402		2,181		1,624		960		272		72		13,870	
	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.
Class I.—Zymotic diseases:																		
Order I.—Miasmatic diseases:																		
Catarrhus epidemicus	8		2								3						13	
Cynanche parotidea	2						6				10		24				42	
Denguis	11										1						12	
Diphtheria	1						2										3	
Erysipelas	10				1		3		3		1		2				20	
Febris cerebro-spinalis	9				2												11	
Febris continua simplex	44	3	10		43		9				17		1		1		125	3
Febris enterica					9	3			3								12	3
Febris flava	10	1	3	2													13	3
Febris intermittens	410		28		78		190	1	151		44		2		2		905	1
Febris recidiva	19	2					6				1						26	2
Febris remittens	123	1	6		18		17		30		4						198	1
Febris typhus																		
Morbilli																		
Pertussis																		
Pestis																		
Phagedæna putris																		
Pyæmia							1	1									1	1
Scarlatina	1																1	
Varicella																		
Variola									1								1	
Varioloides																		
Vaccinia											1						1	
Order II.—Enthetic diseases:																		
Syphilis primitiva	70		9		58		68		92		13		1		5		316	
Syphilis consecutiva	88		4		12		39		94		6		2				245	
Gonorrhœa	30		9		25		32		46		7				7		156	
Ophthalmia gonorrhöica																		
Chancroides											1						1	
Balanitis	1																1	

B.—*Summary of prevalent forms of disease on home and foreign service for the year ending December* 31, 1874—Continued.

	North Atlantic.		South Atlantic.		European.		Pacific.		Asiatic.		Special service.		School and practice.		Coast survey.		Total.	
	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.
Class I.—Zymotic diseases—Continued.																		
Order III.—Dietic diseases:																		
Alcoholismus	16		3		13		40		10		5						87	
Delirium tremens	5	1			3		7		3		4		1		1		24	1
Ebriositas	5		1				2		1		1						10	
Fames																		
Scorbutus	1		1														2	
Class II.—Constitutional diseases:																		
Order I.—Diathetic diseases:																		
Adynamia	189	2	8		19		12		11	1	5		12				256	3
Anæmia	10		2				6										18	
Carcinoma							1										1	
Gangræna senilis																		
Hydrops							3				2						5	
Podagra	6		2				5										13	
Rheumatismus acutus	107		23		11		46		31		28		2		3		251	
Rheumatismus chronicus	167		26		39		101		96		14		4				447	
Epithelioma									1								1	
Order II.—Developmental diseases:																		
Atrophia	1				1												2	
Degeneratio																		
Hypertrophia	2																2	
Senectus	2						1		1								4	
Order III.—Tubercular diseases:																		
Scrofula	3				5				3				1				12	
Tuberculosis	1				1		1										3	
Class III.—Parasitic diseases:																		
Scabies									1								1	
Vermes	6		1				3		2								12	
Class IV.—Local diseases:																		
Order I.—Diseases of the nervous system:																		
Apoplexia	3	1					2	1	1								6	2
Cephalalgia	54		15		3		14		56						6		148	
Cerebritis																		
Chorea	2																2	
Dementia	27				4		5				2						38	

Epilepsia	21		6		2		15		9		5						58	
Insolatio	14						3		2								19	
Irritatio spinalis	1						7										8	
Mania	10		1				3				3						17	
Melancholia	3						1		2								6	
Meningitis	2	1															2	1
Myelitis																		
Neuralgia	61		11		3		31		35		4		1		1		147	
Nostalgia	10										1				1		12	
Paralysis	6						5		1		2						14	
Vertigo	1		1														2	
Sequelæ of variola							1										1	
Irritatio cerebri									1								1	
Insomnia	1																1	
Aphonia	1																1	
Sciatica	1																1	
Order II.—Diseases of the eye:																		
Amaurosis	2				1		1		1								5	
Cataracta							1										1	
Conjunctivitis	54				3		28		13		2		1		1		102	
Fistula lachrymalis																		
Hemeralopia	2		2				1										5	
Iritis	4						1		4		1						10	
Nyctalopia	9																9	
Ophthalmia	6		1		2		3		5		1						18	
Pterygium	1				1												2	
Retinitis	1								1								2	
Ptosis, right lid											1						1	
Ulcus cornea									1								1	
Order III.—Diseases of the ear:																		
Otalgia	4				2		2		2								10	
Otitis	17				2		6		5		1						31	
Otorrhœa	6						5		2								13	
Surditas							1										1	
Order IV.—Diseases of the teeth:																		
Odontalgia	4		1						2		1				1		9	
Order V.—Diseases of the circulatory system:																		
Aneurysma							1										1	
Angina pectoris	2				2	1	1	1	1		3						9	2
Endocarditis	1								1								2	
Hydrops pericardii									1								1	
Hypertrophia cordis	1						2	1	1								4	1
Morbi valvularum cordis	6	1			1		1		6	1	2						16	2
Palpitatio	38		2				6		3		1						50	
Pericarditis	1				5						1						7	
Phlebitis					1												1	
Syncope									1	1							1	1
Varix	5																5	
Order VI.—Diseases of the respiratory system:																		
Apnœa	1																1	
Asthma	4		4		1		17	1	5		2						33	1
Bronchitis acuta	202		3		51		56		40		16				4		372	

B.—*Summary of prevalent forms of disease on home and foreign service for the year ending December* 31, 1874—Continued.

	North Atlantic.		South Atlantic.		European.		Pacific.		Asiatic.		Special service.		School and practice.		Coast survey.		Total.	
	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.
Class I.—Zymotic diseases—Continued.																		
Order III.—Dietic diseases:																		
Alcoholismus	16		3		13		40		10		5						87	
Delirium tremens	5	1			3		7		3		4		1		1		24	1
Ebriositas	5		1				2		1		1						10	
Fames																		
Scorbutus	1		1														2	
Class II.—Constitutional diseases:																		
Order I.—Diathetic diseases:																		
Adynamia	189	2	8		19		12		11	1	5		12				256	3
Anæmia	10		2				6										18	
Carcinoma							1										1	
Gangræna senilis																		
Hydrops							3				2						5	
Podagra	6		2				5										13	
Rheumatismus acutus	107		23		11		46		31		28		2		3		251	
Rheumatismus chronicus	167		26		39		101		96		14		4				447	
Epithelioma									1								1	
Order II.—Developmental diseases:																		
Atrophia	1				1												2	
Degeneratio																		
Hypertrophia	2																2	
Senectus	2						1		1								4	
Order III.—Tubercular diseases:																		
Scrofula	3				5				3				1				12	
Tuberculosis	1				1		1										3	
Class III.—Parasitic diseases:																		
Scabies									1								1	
Vermes	6		1				3		2								12	
Class IV.—Local diseases:																		
Order I.—Diseases of the nervous system:																		
Apoplexia	3	1					2	1	1								6	2
Cephalalgia	54		15		3		14		56						6		148	
Cerebritis																		
Chorea	2																2	
Dementia	27				4		5				2						38	

Epilepsia	21		6		2		15		9		5						58	
Insolatio	14						3		2								19	
Irritatio spinalis	1						7										8	
Mania	10		1				3				3						17	
Melancholia	3						1		2								6	
Meningitis	2	1															2	1
Myelitis																		
Neuralgia	61		11		3		31		35		4		1		1		147	
Nostalgia	10										1				1		12	
Paralysis	6						5		1		2						14	
Vertigo	1		1														2	
Sequelæ of variola							1										1	
Irritatio cerebri									1								1	
Insomnia	1																1	
Aphonia	1																1	
Sclatica	1																1	
Order II.—Diseases of the eye:																		
Amaurosis	2				1		1		1								5	
Cataracta							1										1	
Conjunctivitis	54				3		28		13		2		1		1		102	
Fistula lachrymalis																		
Hemeralopia	2		2				1										5	
Iritis	4						1		4		1						10	
Nyctalopia	9																9	
Ophthalmia	6		1		2		3		5		1						18	
Pterygium	1				1												2	
Retinitis	1								1								2	
Ptosis, right lid											1						1	
Ulcus cornea									1								1	
Order III.—Diseases of the ear:																		
Otalgia	4				2		2		2								10	
Otitis	17				2		6		5		1						31	
Otorrhœa	6						5		2								13	
Surditas							1										1	
Order IV.—Diseases of the teeth:																		
Odontalgia	4		1						2		1				1		9	
Order V.—Diseases of the circulatory system:																		
Aneurysma							1										1	
Angina pectoris	2				2	1	1	1	1		3						9	2
Endocarditis	1								1								2	
Hydrops pericardii									1								1	
Hypertrophia cordis	1						2	1	1								4	1
Morbi valvularum cordis	6	1			1		1		6	1	2						16	2
Palpitatio	38		2				6		3		1						50	
Pericarditis	1				5						1						7	
Phlebitis					1												1	
Syncope									1	1							1	1
Varix	5																5	
Order VI.—Diseases of the respiratory system:																		
Apnœa	1																1	
Asthma	4		4		1		17	1	5		2						33	1
Bronchitis acuta	202		3		51		56		40		16				4		372	

B.—*Summary of prevalent forms of disease on home and foreign service for the year ending December* 31, 1874—Continued.

	North Atlantic.		South Atlantic.		European.		Pacific.		Asiatic.		Special service.		School and practice.		Coast survey.		Total.	
	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.
Class IV.—Local diseases—Continued.																		
Order VI.—Diseases of the respiratory organs—Cont'd.																		
Bronchitis chronica	48	2	11		11		16		22		4		1		1		114	2
Catarrhus	108		32		26		70		69		8		5		1		319	
Epistaxis	3				1						1						5	
Hæmoptysis	5						4										9	
Hydrothorax							1										1	
Laryngitis	9		1		9		4										23	
Phthisis pneumonica acuta	3				1	1			3	2							7	3
Phthisis pneumonica chronica	35	3	1		1		12	1	5		1						55	4
Pleuritis	47		4		9		12		13		5		1		1		92	
Pneumonia	37	1	2		2		11		1		5	1					58	2
Order VII.—Diseases of the digestive system:																		
Ascites	2																2	
Cholera morbus	13		5		21		24		29		14				3		109	
Cirrhosis hepatis	1								1	1							2	1
Colica	56		15		11		12		35		8				3		140	
Colica pictonum					2												2	
Constipatio	35		8		4		12		13		11				5		88	
Diarrhœa acuta	312		25		60		61		165		15		6		16		660	
Diarrhœa chronica	22		2		1		6		29	1	9						69	1
Dysenteria acuta	48		4		7		13		33	3	5		2		1		116	3
Dysenteria chronica	10						1		9								20	
Dyspepsia	52		3		5		12		10		11						93	
Enteritis	2				1		1										4	
Fistula in ano	8		1				2		6								17	
Gastritis	11		2		3		5		2								23	
Hæmatemesis	5				1	1	2	1	1								9	2
Hæmorrhois	30				6		10		12		2						60	
Hepar adeposum											1						1	
Hepatitis acuta	4	1	1		1		1		4						1		12	1
Hepatitis chronica	4		1		1												6	
Icterus	10		1		2		4		9								26	
Peritonitis	1																1	
Pharyngitis	11		13		6		2		2		4		1				39	

Prolapsus ani	3				1						1					5	
Splenitis	1															1	
Stomatitis	10		1		2				1		1					15	
Tonsillitis	51		24		39	1	27		25		11		19			196	1
Typhlitis	1															1	
Order VIII.—Diseases of the urinary and genital system:																	
Albuminuria					2	1	1									3	1
Calculus							1									1	
Cystitis	6				1		3				1		1			12	
Diabetes	1															1	
Dysuria	4						1				1					6	
Ischuria									3							3	
Nephritis	2						1		1		1				1	6	
Orchitis	46		2		22		20		55		13					158	
Paraphymosis	1				1		2						1		1	6	
Phymosis					3		3		4							10	
Enuresis	2				1		3		3				2			11	
Fistula vesicæ	1						1									2	
Hæmaturia	1						2									3	
Hydrocele	7				1				2							10	
Spermatorrhœa	3								1							4	
Urethræ strictura	19		3		4		9		3		1					39	
Varicocele	5				1											6	
Prostatitis	2										2					4	
Nephralgia	1															1	
Epidydimitis	1															1	
Order IX.—Diseases of the locomotive system:																	
Arthritis	2				6		3									11	
Ankylosis	3		1		1		1		1							7	
Caries							1									1	
Coxalgia																	
Hydrops articulorum							1									1	
Necrosis	1										1					2	
Ostitis	1										1					2	
Periostitis	5		1						1							7	
Synovitis	16				5		4		4		1					30	
Spasmus muscularis									1							1	
Order X.—Diseases of the integumentary system:																	
Abscessus	111		22		15		66		41		15				3	273	
Acne	3						1								1	5	
Adenitis	27		14		14		37		27		4					123	
Anthrax	4		2				8		2							16	
Ecthyma	1						2		2							5	
Eczema	7		3		2		3		1				11			27	
Erythema	1				1		3		1		1					7	
Frost-bite											1					1	
Furunculus	188		20		55		62		75		6		1			407	
Herpes	3		2		1		2		5							13	
Impetigo	1								1							2	
Lepra											1					1	
Lichen	3				1		2				1					7	

B.—*Summary of prevalent forms of disease on home and foreign service for the year ending December* 31, 1874—Continued.

	North Atlantic.		South Atlantic.		European.		Pacific.		Asiatic.		Special service.		School and practice.		Coast survey.		Total.	
	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.	Cases treated.	Deaths.
Class IV.—Local diseases—Continued.																		
Order X.—Diseases of integumentary system—Cont'd.																		
Paronychia	32		5		14		30		8		9		2		2		102	
Pemphigus																		
Pernio	3						3		3		3						12	
Porrigo	1																1	
Prurigo							1				1						2	
Psoriasis	2						1		1								4	
Rupia							2										2	
Unguis involutis	2		1														3	
Urticaria	1				2		1										4	
Ulcus	21		1		1		10		16								49	
Verrugas							2										2	
Class V.—Non-malignant tumors and cysts:																		
Adenoma	2								1								3	
Adenitis	3																3	
Angeioma																		
Condylomata							1										1	
Cystis sebacea	1																1	
Enchondroma																		
Tumor	2																2	
Fibroma	4																4	
Lipoma							1										1	
Neuroma																		
Osteoma																		
Polypus			1														1	
Sarcoma																		
Class VI.—Violent diseases and deaths:																		
Order I.—Wounds, injuries, and accidents:																		
Abrasio	37		4		3		13		6		2				1		66	
Ambustio	41		5		8		13		18		6				2		93	
Amputatio	1																1	
Concussio cerebri	25	1			3		18	2									46	3
Contusio	236		28		46		77		51		24		3		2		467	
Explosio													4				4	
Fractura	41		5		2	1	11		11		4						74	1

Hernia	33	.....	4	.....	4	.....	11	.....	4	.....	1	.....	.....	.....	.....	.....	57	.....
Luxatio	13	.....	.....	.....	3	.....	3	.....	5	.....	1	.....	9	.....	2	.....	36	.....
Stremma	76	.....	13	.....	19	.....	51	.....	35	.....	2	.....	.....	.....	.....	.....	196	.....
Submersio	5	3	.....	.....	1	.....	1	1	3	3	.....	.....	.....	.....	.....	.....	10	7
Subluxatio	9	.....	.....	.....	.....	.....	.....	.....	6	.....	.....	.....	.....	.....	.....	.....	15	.....
Venenatio	3	1	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	1
Vulnus contusum	137	1	27	.....	65	.....	64	.....	70	.....	17	.....	1	.....	.....	.....	381	1
Vulnus incisum	81	.....	9	.....	22	.....	33	.....	17	.....	11	.....	3	.....	.....	.....	176	.....
Vulnus laceratum	39	.....	13	.....	2	.....	26	.....	6	.....	5	.....	1	.....	.....	.....	92	.....
Vulnus punctum	32	.....	2	.....	6	1	17	.....	9	.....	4	.....	.....	.....	.....	.....	70	1
Vulnus sclopetarium	4	.....	.....	.....	1	1	1	.....	1	.....	.....	.....	.....	.....	.....	.....	7	1
Vulnus venenatum	2	.....	1	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	1	.....	6	.....
Total	4,213	26	531	2	995	11	1,782	11	1,790	13	475	1	128	.....	81	.....	9,995	64

C.—*Naval hospital fund.*

The condition of this fund is represented as follows:

Balance on hand October 1, 1874	$1,593 85
Transferred to the credit of the fund in settlement of accounts, by the Fourth Auditor, from October 1, 1874, to October 1, 1875	83,075 80
Total	84,669 65
Deduct amount expended from October 1, 1874, to October 1, 1875	82,535 00
Balance on hand October 1, 1875	2,134 65

D.—*Insane of the Navy.*

On the 30th September, 1874, there remained under treatment in the Government Hospital for the Insane, near this city: 4 officers, 1 late ensign, 1 late boatswain's mate, 12 seamen, 4 ordinary seamen, (1 ordinary seaman, engineer force,) 2 ordinary seamen extra, 1 seaman extra, 1 late seaman, 9 landsmen, 1 coal-heaver, 10 marines, and 3 beneficiaries; total		50
Admitted during the year ending September 30, 1875: 3 officers, 3 seamen, 3 ordinary seamen, 1 seaman, (engineer force,) 5 landsmen, 1 late landsman, 1 beneficiary; total		17
Total number under treatment during the year		67
The discharges in the course of the year were:		
By recovery or improvement: 2 officers, 4 seamen, 4 ordinary seamen, 1 ordinary seaman, (engineer force,) 3 landsmen, 1 marine; total	15	
By death: 1 officer, 1 late boatswain's mate, 1 seaman, 1 beneficiary; total	4	
		19
Leaving in the institution, on the 30th September, 1875: 4 officers, 1 late ensign, 10 seamen, 3 ordinary seamen, 1 seaman, (engineer force,) 3 ordinary seamen extra, 1 late seaman, 11 landsmen, 1 late landsman, 1 coal-heaver, 9 marines, 3 beneficiaries; total		48

Estimates of appropriations required for the service of the fiscal year ending June 30, 1877, by the Bureau of Medicine and Surgery.

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1876.
SALARIES.		
One chief clerk, (R. S., p. 70, sec. 416)	$1,800 00	.....
One clerk class three, per act of July 23, 1866, (14 Stat. at L., p. 208, sec. 8)	1,600 00	.....
One messenger, per act of July 12, 1870, (16 Stat. at L., p. 250, sec. 3)	840 00	.....
One laborer, per act of July 12, 1870, (16 Stat. at L., p. 250, sec. 3)	720 00	.....
	4,960 00	$4,960 00
CONTINGENT EXPENSES.		
Stationery and miscellaneous items, (appropriated, 18 Stat. at L., p. 103, sec. 1)	400 00	400 00
SURGEONS' NECESSARIES AND APPLIANCES.		
For the support of the Medical Department of the Navy for vessels in commission, navy-yards, naval stations, marine corps, and coast-survey, (appropriated, 18 Stat. at L., p. 56, sec. 1)	40,000 00	30,000 00
REPAIRS AND IMPROVEMENTS OF HOSPITALS.		
For repairs to Naval Laboratory, naval hospitals and appendages, including roads, wharves, out-houses, sidewalks, fences, gardens, farms, cemeteries, steam-heating apparatus, furniture, head-marks for graves in cemeteries, &c., (appropriated, 18 Stat. at L., p. 56, sec. 1)	20,000 00	20,000 00

Estimates of appropriations required, &c.—Continued.

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1876.
CIVIL ESTABLISHMENT.		
For maintenance of the several hospitals and Naval Laboratory, (appropriated, 18 Stat. at L., p. 56, sec. 1)	$50,000 00	$35,000 00
CONTINGENT.		
For contingent expenses of the Bureau; for freight on medical stores; transportation of insane patients; advertising; telegraphing; purchase of books; expenses attending the naval medical examining boards; purchase and repair of wagons and harness; purchase of cows and horses, and feed for same; purchase of trees, seeds, garden-tools, fuel, &c., (appropriated, 18 Stat. at L., p. 56, sec. 1)	25,000 00	25,000 00

Respectfully submitted.

J. BEALE,
Surgeon-General United States Navy.

No. 8.

BUREAU OF PROVISIONS AND CLOTHING.

BUREAU OF PROVISIONS AND CLOTHING,
October 30, 1875.

SIR: I have the honor to submit herewith estimates, marked A, B, C, and D, for the fiscal year ending June 30, 1877.

The Bureau takes this opportunity to recommend that a plan somewhat similar to that provided for the Army by act of Congress approved May 15, 1872, be adopted in the Navy, to encourage thrift and economy among the sailors, and would respectfully suggest, as to the manner of carrying this plan into effect, that upon the close of each quarter any balance remaining on the books of a paymaster to the credit of a sailor shall bear interest at the yearly rate of 4 per cent., to be calculated from the first of each quarter, and shall remain on the paymaster's books until the end of the cruise. Money allowed to remain on interest to be forfeited by desertion, but to be exempt from forfeiture by sentence of court-martial. This method will not add materially to paymasters' duties, and will obviate the necessity of deposit-books and separate banking accounts, as required by the army system.

It is the opinion of the Bureau that the passage of an act of Congress authorizing a provision of this nature would not only tend to prevent desertions, but would be beneficial to the sailors as well as to the service.

It is also respectfully recommended that appointments to the paymasters' corps of the Navy be made from graduates at the Naval Academy at Annapolis, as it is the opinion of the Bureau, strengthened by the favorable result produced by the appointments to the engineers' corps of the Navy, under the new system, that the proposed change would tend to promote unity of feeling between line and staff officers and add materially to the efficiency of the naval service.

I desire to renew my recommendation that, in lieu of the outfit of clothing recommended by several of my predecessors, a credit of three months' pay be given to each enlisted man when he shall have been

shipped three months, which, in my opinion, would be more effectual to prevent desertions than an outfit to each man at the time of his shipment.

I am, very respectfully, your obedient servant,

JAS. H. WATMOUGH,
Acting Paymaster-General, United States Navy.

Hon. GEO. M. ROBESON,
Secretary of the Navy.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1877, by the Bureau of Provisions and Clothing.

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1876.
A.		
EXPENSES OF THE BUREAU OF PROVISIONS AND CLOTHING.		
For salary of chief clerk, per act of July 5, 1862. (12 Stat. at L., p. 511, sec. 3)	$1,800 00	.....
For salary of one clerk of class four, per act of July 23, 1866, (14 Stat. at L., p. 208, sec. 8)	1,800 00	.....
For salaries of three clerks of class three, per act of July 23, 1866, (14 Stat. at L., p. 208, sec. 8)*	4,800 00	.....
For salaries of two clerks of class two, per act of July 23, 1866, (14 Stat. at L., p. 208, sec. 8)	2,800 00	.....
For salaries of three clerks of class one, per act of July 23, 1866, (14 Stat. at L., p. 208, sec. 8)	3,600 00	.....
For salary of messenger, per act of July 5, 1862, (12 Stat. at. L., p. 511, sec. 3)	840 00	.....
For salary of one laborer, per act of July 12, 1870, (16 Stat. at L., p. 250, sec. 3)	720 00	.....
	16,360 00	$14,760 00
B.		
CONTINGENT EXPENSES OF THE BUREAU.		
For blank-books, stationery, and miscellaneous items, (appropriated, 18 Stat. at L., p. 363)	800 00	800 00
C.		
PROVISIONS FOR THE NAVY.		
For provisions for officers, seamen, and marines viz: 8,500 men, 900 commissioned officers, and 1,200 marine officers and privates; and for expenses incidental to the preservation and handling of provisions, (appropriated, 18 Stat. at L., p. 300)	1,244,000 00	.....
For the purchase of water for ships, (appropriated, 18 Stat. at L., p. 300)	35,000 00	.....
	1,279,000 00	1,279,000 00
D.		
CONTINGENT EXPENSES OF THE NAVY UNDER BUREAU OF PROVISIONS AND CLOTHING.		
For candles; for fuel; for books and blanks; for stationery; for telegrams and express-charges; for tolls, ferriages, and car-tickets; for ice, and for incidental labor not chargeable to other appropriations, (appropriated, 18 Stat. at L., pp. 56, 300)	†60,000 00	50,000 00

* The estimate for an additional clerk of class three (allowed by act of July 23, 1866) is submitted on account of the Department's order of July 21, 1873, requiring the accounts of all pay-officers to be settled quarterly instead of at the end of a cruise.

† Prior to the fiscal year 1874-'75 the annual appropriation under contingent, Bureau of Provisions and Clothing, was $75,000, and it is found, by the experience of the past year, that a smaller sum than the above estimate is inadequate to the wants of the service.

JAS. H. WATMOUGH,
Acting Paymaster-General, United States Navy.

NAVY DEPARTMENT, BUREAU OF
PROVISIONS AND CLOTHING, *October* 30, 1875.

No. 9.

BUREAU OF STEAM-ENGINEERING.

NAVY DEPARTMENT, BUREAU OF STEAM-ENGINEERING,
Washington, November 13, 1875.

SIR: I have the honor to submit the annual report of this Bureau, with estimates for the several navy-yards, for repairs to the machinery of naval steamers, for the preservation and refitting of machinery of vessels on cruising stations, and for necessary materials, stores, supplies, &c., under cognizance of this Bureau.

MACHINERY, ETC., REPAIRED.

During the year past, the machinery of the following-named vessels has been repaired and refitted for active service. Those marked with an asterisk (*) have had new boilers placed on board: Franklin, (first rate,) Pensacola, (second rate,) Plymouth, (second rate,) Ticonderoga, (second rate,) Ossipee, (third rate,) Tuscarora, (third rate,) Canonicus, (iron-clad, fourth rate,) *Jason, (iron-clad, fourth rate,) *Montauk, (iron-clad, fourth rate,) *Nantucket, (iron-clad, fourth rate,) Saugus, (iron-clad, fourth rate,) Gettysburg, (fourth rate,) Tallapoosa, (fourth rate,) and *Palos, (fourth rate.) Repairs to the machinery of the following-named vessels are now being executed. Those marked with an asterisk will receive new boilers: *Benicia, (second rate,) *Amphitrite, (iron-clad, third rate,) *Monadnock, (iron-clad, third rate,) *Terror, (iron-clad, third rate,) *Ashuelot, (third rate,) *Iroquois, (third rate,) Monocacy, (third rate,) Comanche, (iron-clad, fourth rate,) *Cohasset, (tug,) *Leyden, (tug,) *Mayflower, (tug,) *Phlox, (tug,) *Rose, (tug,) and Snowdrop, (tug.)

The following-named vessels need repairs to their machinery. Those marked with an asterisk (*) will require new boilers: Colorado, (first rate,) *Wabash, (first rate,) *Brooklyn, (second rate,) Alaska, (second rate,) Benicia, (second rate,) Canandaigua, (second rate,) *Congress, (second rate,) Dictator, (iron-clad, second rate,) *Lancaster, (second rate,) *Shenandoah, (second rate,) *Worcester, (second rate,) *Juniata, (third rate,) *Narragansett, (third rate,) *Saco, (third rate,) *Wachusett, (third rate,) *Wyoming, (third rate,) *Pinta, (tug,) and Standish, (tug.)

NEW MACHINERY, ETC.

At the Norfolk navy-yard, new machinery of the compound type is being constructed for the Galena, and at the Mare Island yard similar machinery for the Mohican.

Since my last report, compound engines for the Alert, Alliance, Ranger, Adams, Essex, and Huron have been completed and successfully tried. Compound engines for the Trenton, Enterprise, and the double-turreted monitor Miantonomoh are in process of construction, and are being erected on board the two former vessels.

Engines for the Marion, Quinnebaug, and Vandalia have been converted from simple to compound engines in the navy-yards, and are being erected on board. These vessels, so far as the machinery is concerned, will be ready for sea in a few weeks.

Duplicate machinery is required for the Amphitrite, Terror, and Monadnock, all of which are twin-screw monitors.

THE NEW COMPOUND ENGINES AT SEA.

The Swatara, the first of the compound-engine ships, has made successfully a voyage round the world, on service connected with the Transit of Venus expedition. The vessel encountered tempestuous weather and a continuous succession of gales off Cape Horn and in the high southern latitudes visited. Before sailing she had not been subjected (for want of time) to the usual trial-trip at sea; but notwithstanding this, the fact was established on the voyage that no type of engine yet used in the Navy had produced such economical results as the compound engines with which the Swatara was fitted.

The Tennessee, fitted with compound engines designed and built at the Morgan Iron Works, New York, has been sent to the Asiatic station. Chief Engineer W. H. Shock, under whose supervision the work was constructed and erected, was sent with the ship as far as Suez to witness the performance of the machinery. His reports are appended hereto, marked A and B.

Table C is a tabulated schedule of the compound engines designed by or for the Bureau, giving all necessary dimensions, &c.

BOILERS.

During the past year boilers have been built, or are now in process of construction, for the following vessels: Lancaster, Shenandoah, Wachusett, Amphitrite, Monadnock, Terror, Jean Sands, Phlox, Cohasset, Leyden, Mayflower, Pinta, Rose, Speedwell, Triana, and Standish. Those for the eight last-named vessels are already completed.

Two of the boilers removed from the California at the Mare Island navy-yard were placed in the Pensacola, flag-ship of the North Pacific station. The remaining two have been placed in the Lackawanna.

Table D shows the relative endurance or lifetime of steam-boilers used in connection with machinery of different types in United States naval steamers. It appears from this that vessels fitted with the old type of jet-condensers were able to use their boilers a much longer time than those furnished with the more modern type of tubular or surface-refrigerating condensers; but the economy in fuel effected by the use of the latter improved condenser more than compensated for the increased cost of boilers in each case. The decay of boilers incident to the use of the surface-condenser has now been arrested to a great extent by the use of the filtering apparatus, which promises in the future an extended period of endurance of the boilers in connection with which it may be applied.

COMPARATIVE ECONOMY OF THE VARIOUS TYPES OF ENGINES.

The following table has been compiled from the log-books of United States naval steamers fitted with different types of machinery, to show the relative cost in pounds of coal per indicated horse-power per hour. It will also be seen that since the introduction of steam into the vessels of the Navy the economy, efficiency, and character of the machinery has steadily advanced.

Table showing the relative economic performance of the machinery of the vessels of the Navy from 1843 to 1864, all being simple engines.

Name of vessel.	Steam-pressure in boilers in pounds per square inch above the atmosphere.	Number of times the steam was expanded.	Pounds of anthracite consumed per hour per indicated horse-power.	Remarks.
Mississippi	16	4.00	4.00	Paddle-wheel; jet-condensers.
Powhatan	16	4.00	4.00	Do.
Susquehanna	16	4.00	4.00	Do.
Saranac*	18	2.77	3.50	Do.
State of Georgia	19	2.28	4.173	Do.
Fulton	15	2.94	4.009	Do.
Niagara	19	3.28	3.80	Screw-frigate; jet-condensers.
Minnesota	11.3	3.00	4.268	Do.
Roanoke	13	3.19	4.264	Do.
Colorado	13	3.19	4.264	Do.
Merrimac	13.5	3.25	4.371	Do.
Wabash	15	3.26	4.091	Do.
Pensacola	27.8	5.37	5.044	Dickerson's engine.
Brooklyn	18.0	3.00	3.953	
Wyoming	16.8	2.60	3.641	
Iroquois	17.0	3.00	3.50	
Chippewa, Huron, Penobscot, Winona, Sciota, Kennebec, Pinola, Marblehead, Sagamore, Katahdin, Aroostook, Tahoma, Cayuga, Chocura, Itasca, Kanawha, Kineo, and Owasco.	20	1.666	3.757	These vessels have duplicate machinery, and the results are the mean of all their trials.
Miami	26.5	1.45	3.605	Paddle-wheel; surface-condenser.
Octorara	35.0	1.666	3.285	Do.
Port Royal	21.0	4.00	3.894	Do.
Adirondack, Ossipee, Canandaigua, Juniata, Sacramento, Lackawanna, Monongahela, Shenandoah, and Ticonderoga.	25.3	1.82	3.550	These vessels have duplicate machinery, and the results are the mean of their trials.
Tacony, Mattabesett, Osceola, Chenango, Mendota, Chicopee, Tallapoosa, Ascutney, Shamrock, Agawam, Sassacus, Otsego, Pawtuxet, Pontoosuc, Pontiac, Wyalusing, Wateree, Iosco, Massasoit, and Mingoe.	23.5	1.666	3.276	Paddle-wheel vessels, with duplicate machinery. The results are a mean of all their trials. Surface-condensers.
Eutaw	27.6	1.96	2.962	Paddle-wheel; surface-condenser; superheated steam.
Nipsic, Shawmut, and Nyack	25.0	1.666	3.750	Duplicate machinery; surface-condensers; a mean of all their trials.
Maumee	24.6	2.500	3.842	Surface-condenser.
Swatara	35.0	2.000	3.773	Original vessel.
Pensacola	30.0	2.000	3.494	New engines.
Dictator	17.9	2.500	6.080	Jet-condenser.
COMPETITIVE ENGINES.				
Idaho	37.9	7.70	7.600	Dickerson's engine.
Chattanooga	27.5	1.92	6.160	Merrick & Son's engine.
Madawaska	29.8	1.66	5.170	Ericsson's engine.
Wampanoag	32.4	1.50	3.129	Bureau's engine.
IRON-CLADS.				
Miantonomoh	35.1	1.82	4.068	
Monadnock	20.4	1.35	3.869	
Tonawanda	23.0	1.50	3.825	
Economic efficiency of compound engines designed since 1872.				
Tennessee	58.13	6.57	3.46	
Alarm	58.0	5.53	2.36	
Intrepid	63.0	3.84	3.17	
Swatara	64.2	6.50	2.03	Converted from simple engine.
Huron	49.0	6.50	2.79	
Adams	77.7	5.05	2.25	

* Experiment made with fresh water in boilers.

SCREW-PROPELLERS.

The log-books of the naval steamers having two-bladed screws show great loss of speed, owing to the insufficient area of the blades. My last report included an exhaustive treatise on the screw-propeller, and from carefully-conducted experiments cited therein, the fallacy of the use of two-bladed screws, as applied to our vessels, was made apparent. In consideration of the facts elicited, and with the permission of the honorable Secretary of the Navy, the four-bladed screws have been restored to several of our naval steamers, and these changes will be continued as opportunities are afforded.

MACHINIST SYSTEM.

Owing to the great number of vacancies in the naval engineer corps, much of the duty formerly devolving upon engineer officers is now performed by a class of enlisted men rated as machinists. In the effort to procure the best and most reliable class of men for this duty, the pay of the grade was increased as an inducement for accepting the positions, but little improvement in this direction has resulted, and injury to boilers and machinery, in consequence of ignorance or neglect of irresponsible men in charge of the regular steaming watches, has become a frequent occurrence, attended with great danger, and disabling the machinery for the time being and until repairs are effected, in many cases of a most expensive character.

On a comparison of the actual cost of vessels in commission with full complements of machinists, and again with engineer officers, it is found to be cheaper when the latter are employed, in view of the increased cost for repairs to machinery, without reference to the proper and efficient maintenance of the engineer department, or to the danger resulting from accidents avoidable by the employment of responsible engineer officers.

FIREMEN.

Since my last annual report, the seamen and ordinary seamen who were enlisted, or had been detailed for service in the engineer's force, have been rated as first and second class firemen, and given the pay established for those grades. It is hoped that the restoration of these rates will attract to the service the class of experienced firemen who formerly enlisted, but who for some years past have almost ceased to be represented in the Navy.

PERSONNEL OF THE ENGINEER CORPS.

A large number of vacancies still exist in the list of Assistant Engineers, and but few qualified candidates are applying for the positions. The engineer graduates of the Naval Academy are filling some of these vacancies very satisfactorily, but they are insufficient in number at the present time. The system of educating officers for the engineer corps at Annapolis is one that cannot be too strongly commended. It is already bearing good fruit in the service, as the graduates are highly commended for usefulness and zeal by their superior officers. At Annapolis we have a scientific school of mechanical and marine engineering second to none in the world, and I would respectfully recommend that its usefulness be extended by increasing the number of cadet-engineers to such an extent as to fill in a short time the vacancies now existing in the corps, and render unnecessary any further appointments direct from civil life. Officers trained at the academy necessarily enter the service at an earlier age than direct appointees, and for that reason

will be much more likely than they to remain permanently in the Navy, and not resign when from experience their services have attained their highest value to the Government. In this connection, it is gratifying to remark that the suggestions in my last annual report, in regard to the physical culture of the cadet-engineers, have been carried out. I fully concur in the recommendation made by the last board of visitors that the steam-building should be enlarged.

THE NAVY-YARDS.

There is in the steam-engineering plant of the several navy-yards a large amount of valuable machinery, affording means adequate to maintaining in proper and efficient condition the machinery of the vessels of the Navy as at present constituted, and for the construction of such marine engines and boilers as may properly be required for the naval purposes of a strictly peace organization. Should, however, any emergency arise rendering necessary any considerable increase of the naval force, the resources of private establishments (machine-shops and founderies) would necessarily be called into requisition. The limited amount appropriated for the purposes of this Bureau renders it necessary to economize and reduce its expenditures to the lowest possible limit. The hours of labor in the navy-yards have been reduced by act of Congress by two-tenths from those previously required as a day's work. This has had the effect of increasing the expenditures for labor practically one-fourth for the same amount of work; and hence it has become cheaper to procure much of the work formerly executed at the yards, from private establishments. One-third of the whole amount appropriated by Congress for the purposes of this Bureau is absorbed by labor in navy-yards; and under the changed conditions above referred to, the amount expended for labor will need to be increased one-fourth in order to obtain the same result in work as formerly.

EXPERIMENTS.

The cost of conducting experiments, and of obtaining therefrom reliable data tending to secure increased efficiency and economy in all matters pertaining to the science of marine propulsion, precludes private individuals and corporate companies from attempting them, except upon a very limited scale. The engineering skill of this and other maritime nations looks to their governments to conduct these experiments, and to publish for the general good the data and deductions obtained from them. Since the close of the late rebellion Congress has ceased to grant appropriations for experimental purposes under cognizance of this Bureau; and in order to obtain data for the deductions that lead to improved designs for machinery, the Bureau has been compelled to seek such reliable information as could be procured from private sources.

The use of a steam-jacket upon the steam-cylinder, now an inherent part of the compound engine, is one of the means by which its economy is attained. This steam-jacket has recently been applied to the steam-cylinders of the ordinary simple type, carrying high steam and using a high grade of expansion, and an economy approaching that of the compound engine is claimed to have resulted.

In this connection the report of Chief Engineer B. F. Isherwood, (marked E) and that of Chief Engineer Charles H. Loring and Mr. C. E. Emery, (marked F) are herewith submitted. The former is on a series of experiments made in the year 1864 for Mr. George V. Hecker, and the latter is on the trial of the United States revenue steamer Gallatin, which took place during the current year. The results show large gains by the use of the steam-jacket under all the different conditions under

which it was tried, the economic efficiency of the jacketing increasing with the measure of expansion used, other things being equal.

Facilities have been afforded to the Treasury Department, by this Bureau, for conducting a series of experiments with safety-valves at the Washington navy-yard, under the direction of Mr. William Burnett, supervising inspector-general of the steamboat-inspection service. These experiments are of grave and serious importance to the country at large, and especially so to the traveling public, and to such as are directly engaged in the manufacture of steam-generators, and it has only been for want of funds that this Bureau has not made these experiments some years since.

I respectfully but earnestly suggest the importance of appropriating a yearly sum for the prosecution, under the cognizance of this Bureau, of such experiments as may be deemed proper by the honorable Secretary of the Navy.

Very respectfully, your obedient servant,

WM. W. W. WOOD,
Chief of Bureau.

Hon. GEO. M. ROBESON,
Secretary of the Navy.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1877, by the Bureau of Steam Engineering.

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 1876.
SALARIES.		
Chief clerk, per act of July 5, 1862, (12 Stat. at L., p. 511, sec. 3)	$1,800 00	.....
Draughtsman, per act of July 5, 1862, (12 Stat. at L., p. 511, sec. 3, and March 2, 1867, 14 Stat. at L., p. 450, sec. 1)	1,800 00	.....
One clerk of class two, per act of March 2, 1867, (14 Stat. at L., p. 450, sec. 1)	1,400 00	.....
One assistant draughtsman, per act of July 5, 1862, (12 Stat. at L., p. 511, sec. 3)	1,200 00	.....
One messenger, per act of July 5, 1862, (12 Stat. at L., p. 511, sec. 3, and July 12, 1870, 16 Stat. at L., p. 250, sec. 3)	840 00	.....
One laborer, per act of July 5, 1862, (12 Stat. at L., p. 511, sec. 3, and July 12, 1872, 16 Stat. at L., p. 250, sec. 3)	720 00	.....
	7,760 00	$7,760 00
CONTINGENT.		
Stationery and miscellaneous items, (appropriated)	1,200 00	1,000 00
PUBLIC PRINTING AND BINDING.		
For printing and binding to be executed under the direction of the Congressional Printer, per act of March 8, 1872, (17 Stat. at L., p. 82, sec. 2)	4,000 00	3,000 00
STEAM MACHINERY.		
Repairs and preservation of machinery, boilers, &c., on all naval vessels, (appropriated)	1,150,000 00	.....
Fitting, repairs, and preservation of machinery and tools in the several navy-yards, (appropriated)	50,000 00	.....
Labor in navy-yards and stations not included above, and incidental expenses, (appropriated)	100,000 00	.....
Purchase and preservation of oils, coals, metals, and all material and stores, (appropriated)	500,000 00	.....
	1,800,000 00	1,800,000 00

A.

UNITED STATES STEAMER TENNESSEE,
At anchor off Palermo, August 7, 1875.

SIR: My report of July 13 left the ship at anchor off Gibraltar, having made the passage from New York in fifteen days eleven and one-half hours actual time. Immediate preparations were made to coal the ship, and in other respects prepare for sea.

On the 28th of July at 6.35 p. m., all hands were called to "up anchor," (Lieut. Commander William C. Wise, in charge of the deck,) ship riding to anchor with 40 fathoms chain, and heading north. In nine minutes from the time the order was given the anchor was up and the ship under way, heading south. I mention these facts as indicating the excellent discipline existing on board the ship, the result of the efforts of Mr. Wise, as well also to show with what facilities the engines can be handled.

At 7 p. m. the ship was on her course, east ¾ south, and abreast of Europa Point light; six boilers in operation, using Cardiff coal; draught of ship aft, 22½ feet; forward, 20¼ feet; greatest immersed sectional area, 741 square feet; displacement, 4,735 tons.

The weather during the passage was fair, smooth sea, with light and variable airs. On the morning of August 1, made the western end of the Island of Sicily, and at 10.30 p. m. steamed the engines to bell, running in to an anchorage off Palermo; distance from Gibraltar, 925 knots; running time, 99½ hours; average speed during the passage was 9 knots per hour; the maximum speed maintained for any one hour (August 1) was 10 knots. The total consumption of coal for all purposes, that is, steaming, distilling water for ship's use, steam used in driving distilling-pump, and including 12 per cent. added to cover incidental losses, amounted to 141.5 tons for the entire passage.

It is difficult to eliminate from the total expenditure of coal for any given period the exact amount used for other than steaming purposes. I therefore leave it as chargeable to the engines, and subtract only the 12 per centum added for supposed losses, and there remains as the absolute consumption of coal for the run from Gibraltar to Palermo 124.7 tons, an average of 30 tons per day.

It is proper to state that the report of the consumption of coal from New York to Gibraltar, contained in my letter of July 13, included that used for all purposes, as well also the 5 per centum added for incidental losses. The ship will coal at once and proceed without delay to Port Said.

I am, very respectfully,

WM. H. SHOCK,
Chief Engineer, United States Navy.

HON. GEO. M. ROBESON,
Secretary United States Navy, Washington, D. C.

B.

UNITED STATES STEAMER TENNESSEE,
At anchor, Port Said, Egypt, August 13, 1875.

SIR: On Sunday, August 8, at 5 a. m., ship left Palermo for this port, using the six forward boilers, (Cardiff coals,) course east, wind northeast by east; force 1-2; fore and aft sail set, engines, boilers, and dependencies working satisfactorily; draught of ship aft, 22 feet 3 inches; forward, 20 feet 5 inches; immersed sectional area, 734½ square feet; displacement, 4,680 tons. During this run the 10-knot economic trial was made by order of Rear-Admiral Reynolds, beginning at noon on the 10th instant, and terminating at noon the 11th, equal to twenty-four hours, less eight minutes' difference of longitude; total distance made good, (see navigator's report, copied herewith,) 249 knots, (all spars aloft,) or an average of 10½ knots per hour; total actual consumption of coal for all purposes, including distilling, during this trial, 32.6 tons; the actual measured distance run from Palermo to Port Said was 1,070 knots; time, 106 hours, and $1070 \div 106 = 10.1$ knots per hour for the entire passage.

"*Navigator's official report.*

"NOON, *August* 11, 1875.

"lat., D. R., 33° 10′ N.;
long., D. R., 26° 46′ E.;
lat. obs., 33° 07′ N.;
long., chro., 26° 50′ E.;
distance per log, 243½ K.;
distance per pat log, 257 K.;
distance made good, 249 K.;
course, S. 66° E.;
current, 5 K. S. 5.4 E.;
water distilled, 1,200 gallons;
water expended, 800 gallons;
water on hand, 5,900 gallons.

"Respectfully,

"C. F. GOODRICH,
"*Navigator.*

"Capt. W. W. LOW,
"*Commanding Tennessee.*"

I take pleasure in being able to report that no accident or defect whatever has occurred to the engines, boilers, or dependencies, by which the ship has been delayed on the passage from Gibraltar to this port. I inclose herewith copy of report to the honorable Secretary of the Navy. The greatest dispatch is being used in coaling ship, which will be completed to-night, and at daylight to-morrow morning, will start on our passage, through the canal, to Suez, at which point I leave the ship on my return home.

I am, very respectfully, your obedient servant,

WM. H. SHOCK,
Chief Engineer, United States Navy.

Engineer-in-Chief WM. W. W. WOOD, U. S. N.,
Washington, D. C.

C.—*Table containing the data concerning the dimensions, designing, and building of the new compound engines.*

Names of vessels.	ENGINES.									BOILERS.						
	Cylinders.				Stroke of pistons, in inches.	Area of condensing surface, in square feet.	Indicated horse-power, (calculated.)	Where designed.	Where built or building.	Number of.	Diameter of, in feet and inches.	Length of, in feet and inches.	Total area of grate, in square feet.	Number of furnaces.	Where designed.	Where built or building.
	Number of—		Diameter of—													
	High pressure.	Low pressure.	High pressure.	Low pressure.												
SLOOPS.																
Tennessee	2	2	40	78	40	.....	.....	Morgan Iron Works.	Morgan Iron Works.	10	11.6	10.6	478	20	Morgan Iron Works.	Morgan Iron Works.
Trenton	1	2	58½	78	48	7,500	3,500	Bureau	....do	8	12	10.3	464	24	....do	Do.
DOUBLE-TURRETED MONITORS.																
Terror *	2	2	32	48	42	4,500	1,800	....do	.....	6	12	.....	324	18	Bureau	Cramp & Sons.
Monadnock *	2	2	32	48	42	4,500	1,800	....do	.....	6	12	.....	324	18	....do	Continental Works.
Miantonomoh *	2	2	32	48	42	4,500	1,800	....do	Morgan Iron Works.	6	12	.....	324	18	....do	Chester.
Amphitrite *	2	2	32	48	42	4,500	1,800	....do	.....	6	12	.....	324	18	....do	Wilmington.
TORPEDO-BOATS.																
Alarm †	2	2	20	38	30	.....	.....	Morgan Iron Works.	Morgan Iron Works.	4	10	11.6	169	8	Morgan Iron Works.	Morgan Iron Works.
Intrepid *	2	2	24	48	24	.....	.....	....do	....do	6	10	9.3	260	12	....do	Do.
GUNBOATS.																
Alert	1	1	28¼	42½	42	1,684	560	Bureau	Chester	5	8	8.1	120	5	Bureau	Chester.
Huron	1	1	28¼	42½	42	1,684	560	....do	....do	5	8	8.1	120	5	....do	Do.
Ranger	1	1	28¼	42½	42	1,684	560	....do	....do	5	8	8.1	120	5	....do	Do.
SLOOPS.																
Swatara	1	1	42	64	42	3,000	1,132	....do	New York navy-yard.	10	8	8.1	240	10	....do	New York navy-yard.

* Twin screws. † Fowler propeller.

C.—*Table containing the data concerning the dimensions, &c.*—Continued.

Names of vessels.	ENGINES.									BOILERS.						
	Cylinders.				Stroke of piston, in inches.	Area of condensing surface, in square feet.	Indicated horse-power, (calculated.)	Where designed.	Where built or building.	Number of.	Diameter of, in feet and inches.	Length of, in feet and inches.	Total area of grate, in square feet.	Number of furnaces.	Where designed.	Where built or building.
	Number of—		Diameter of—													
	High pressure.	Low pressure.	High pressure.	Low pressure.												
SLOOPS—Continued.																
Vandalia	1	1	42	64	42	3,000	1,132	Bureau	Boston navy-yard.	10	8	8.1	240	10	Bureau	Boston navy yard.
Marion	1	1	42	64	42	3,000	1,132	...do	Kittery navy-yard.	10	8	8.1	240	10	...do	Kittery navy-yard.
Quinnebaug	1	1	42	64	42	3,000	1,132	...do	Philadelphia navy-yard.	10	8	8.1	240	10	...do	Philadelphia navy-yard.
Mohican	1	1	42	64	42	3,500	1,132	...do	Mare Island navy-yard.	10	8	8.1	240	10	...do	Mare Island navy-yard.
Galena	1	1	42	64	42	3,500	1,132	...do	Norfolk navy-yard.	10	8	8.1	240	10	...do	Norfolk navy-yard.
GUNBOATS.																
Nipsic	1	1	34	51	42	2,700	800	...do	Newburgh	8	8	8.1	192	8	...do	Newburgh.
Alliance	1	1	34	51	42	2,700	800	...do	Quintard Iron Works.	8	8	8.1	192	8	...do	Quintard Iron Works.
Enterprise	1	1	34	51	42	2,700	800	...do	Woodruff Iron Works.	8	8	8.1	192	8	...do	Woodruff Iron Works.
Adams	1	1	34	51	42	2,700	800	...do	Atlantic W'ks	8	8	8.1	192	8	...do	Atlantic W'ks
Essex	1	1	34	51	42	2,700	800	...do	...do	8	8	8.1	192	8	...do	Do.

C.—*Table containing the data concerning the dimensions, &c.*—Continued.

Names of vessels.	HULLS.					SCREWS.				
	Length on load-line.	Extreme beam.	Greatest area of immersed cross section.	Displacement, in tons, at load draught.	Where built or building.	Type of screw.	Diameter, in feet and inches.	Mean pitch, in feet and inches.	Length, in inches.	Helicoidal area, in square feet.
SLOOPS.										
Tennessee	335	45.2	721	4,170	New York navy-yard	Hirsch	19	31	.....	90
Trenton	253	47	770	3,650	....do	....do	19	.....	.....	.....
DOUBLE-TURRETED MONITORS.										
Terror *	250	55.5	700	3,750	Cramp's	Bureau	12	19	29	78
Monadnock *	250	55.5	700	3,750	Continental Works	....do	12	19	29	78
Miantonomoh *	250	55.5	700	3,750	Chester	....do	12	19	29	78
Amphitrite *	250	55.5	700	3,750	Wilmington	....do	12	19	29	78
TORPEDO-BOATS.										
Alarm †	158.8	28	180	800	New York navy-yard	Fowler wheel	.....	.....	.....	.....
Intrepid *	170	35	350	1,130	Boston navy-yard	Hirsch	10	15	.....	35.268
GUNBOATS.										
Alert	175	32	300	995	Chester	....do	12	18	18¾	39
Huron	175	32	300	995	....do	....do	12	18	18¾	39
Ranger	175	32	300	995	Wilmington	Bureau	12	17.3	20¾	56.3
SLOOPS.										
Swatara	216	37	450	1,840	New York navy-yard	....do	15.6	21	21	79
Vandalia	216	37	450	1,840	Boston navy-yard	....do	15.6	21	21	79
Marion	216	37	450	1,840	Kittery navy-yard	....do	15.6	21	21	79
Quinnebaug	216	37	450	1,840	Philadelphia navy-yard	....do	15.6	21	21	79
Mohican	216	38	460	1,860	Mare Island navy-yard	....do	15.6	21	21	79
Galena	216	37	450	1,840	Norfolk navy-yard	....do	15.6	21	21	79
GUNBOATS										
Nipsic	185	35	360	1,370	Washington navy-yard	Hirsch	15.6	21	.....	.....
Alliance	185	35	360	1,370	Norfolk navy-yard	Bureau	14	19	21	69
Enterprise	185	35	360	1,370	Kittery navy-yard	....do	14	19	21	69
Adams	185	35	360	1,370	Boston	....do	14	19	21	69
Essex	185	35	360	1,370	Kittery navy-yard	....do	14	19	21	69

* Twin screws. † Fowler propeller.

D.—*Table showing the relative length of service of Navy boilers used with the two kinds of condensers.*

Name of vessel.	Number of years the boilers remained in the vessel.	Kind of condenser.	Relative length of life of boilers, used with the two kinds of condensers.	Number of years the vessels remained in commission with the boilers referred to.	Relative length of life of boilers, used with the two kinds of condensers, represented in length of time they were in the vessel, in commission.
Minnesota	15	Jet	13 years, 10 months.	6	8 years, 9 months.
Roanoke	18			9	
Saranac	18			15	
Hartford	12			8½	
Lancaster	10			7½	
Brooklyn	10			6½	
Franklin	8	Surface	9 years	3½	7 years, 2 months.
Iroquois	9			9	
Kearsarge	11			9	
Tuscarora	10			9½	
Ossipee	10			9	
Shenandoah	7			4	
Pensacola	10			8	
Wyoming	9			5½	
Benicia	7			8	
Plymouth	6			4½	
Lackawanna	12			9	

E.—*Experiments made by Henry Watermann, in* 1864, *at the Clinton Foundery, No.* 239 *Cherry street, New York City, on a small experimental steam-engine, to determine, in rapport of power produced, the relative economic efficiency of steam used with and without condensation, and with different measures of expansion, in a cylinder with and without steam-jackets.*

The experiments whose data and results are embodied in this report were made in 1864, at the Clinton Foundery, No. 239 Cherry street, New York City, by Mr. Henry Watermann, its proprietor and manager. They were undertaken for Mr. George V. Hecker, the eminent flour-manufacturer and owner of several large mills, who, with great liberality, defrayed the cost, and assisted by his suggestions from a disinterested desire to advance information on a subject with which he was well acquainted, and which he considered superior to any other in its effect on the material well-being of mankind.

These experiments were not made in the interest of any patent, nor with a view to establish any theory. No possible outcome from them could pecuniarily or otherwise advantage any person connected with them; and, after their completion, the original tabular records, indicator-diagrams, drawings of the machinery, &c., were transmitted to the writer for reduction, calculation, and generalization, who alone is responsible for the correctness of the computations and the truth of the deductions, as Mr. Watermann is for the accuracy of the observed data.

The machinery employed was designed and constructed expressly for the purpose of these experiments. The cylinder of the engine was steam-jacketed on top, bottom, and sides, and its piston and piston-rod were also steam-jacketed. This was steam-jacketing with a completeness never before or since attempted, and the jackets were so arranged that the steam could be excluded at will from any or all of them. The experiments thus made determine the following facts, all of which are of great economic importance in the use of steam as a motor, and practically applicable to the steam-engine:

1st. The relative economic efficiency of steam used with condensation and with different measures of expansion in a cylinder without steam-jackets.

2d. The relative economic efficiency of steam used with condensation and with different measures of expansion in a cylinder with steam-jackets.

3d. The economic effect of steam of different pressures in the jackets above the initial cylinder-pressure.

4th. The economic effect due separately to the steam-jacket of the cylinder top, to the steam-jacket of the cylinder bottom, to the steam-jacket of the cylinder sides, and to the steam-jacket of the cylinder-piston and piston-rod.

5th. The relative economic efficiency of steam used without condensation and with different measures of expansion in a cylinder with steam-jackets.

6th. The economic effect produced by the admission to or exclusion from the cylin

der of the water of condensation caused in the valve-chest by its external radiation of heat.

7th. The economic effect produced by the absolute mean total pressure in the cylinder.

8th. The steam-condensation produced by the inner metallic surfaces of the cylinder.

9th. The quantity of steam condensed in the jackets of the cylinder.

10th. The relative economic efficiency of steam used with different measures of expansion.

11th. The economic vaporization by the boiler.

Before proceeding to give the data and discuss the results, it is necessary to describe the machinery with which the experiments were made and the manner of making them, as follows:

ENGINE.

The engine consisted of a vertical cylinder bolted to a channel-plate which contained the jet-condenser and air-pump, the latter being worked by a half-beam which received its motion through links from the cross-head of the cylinder. The air-pump was vertical, single acting and lifting, and the feed-pumps were worked from its cross-head.

The cylinder had two valve-chests, one at each end, and each valve-chest contained two valves, namely, the steam-valve and the expansion or cut-off valve. The steam-valve was an ordinary three-ported slide with sufficient steam-lap to cut off the steam at nine-tenths of the stroke of the piston from the commencement, and with exhaust-lap so proportioned as not to produce any cushioning or compression of the back pressure in the cylinder. The cut-off valve was composed of a plate working on a separate seat immediately over the steam-valve. The two valve-chests were connected by a pipe, through which passed the rods connecting the two steam-valves and the two cut-off valves. Both the steam-valve and the cut-off valve received their motion from eccentrics, and for each point of cutting off a different plate was employed, as the cutting off was effected entirely by its lap.

The top and sides of the cylinder were well protected from heat-radiation by felt and lagging, as was also the steam-pipe; but the whole of the valve chests and their connecting pipe, extending the entire length of the cylinder, were bare.

The top, bottom, and sides of the interior of the cylinder were steam-jacketed by means of a lining of sheet-steel one-tenth of an inch in thickness. The width of the jacket, or space in clear between the steel lining and the cast iron of the cylinder, was three-fourths of an inch. The lining was secured to the cast iron every 2¼ inches by screw-braces of three-eighths of an inch in diameter, and having twenty-four threads to the inch; that is to say, the sides of the squares formed by the braces were 2¼ inches long between the centers of the braces. The three jackets of the cylinder—that is to say, the jackets of its top, bottom, and sides—were separate, but communicated with each other by means of short pipes fitted with stop-cocks, so that they could be disconnected and either jacket employed alone. They received their steam directly from the boiler, and the water of condensation, or condensed steam, was drawn off through drip-pipes fitted with stop-cocks into suitable vessels, where it was accurately weighed.

The top and bottom of the piston were also steam-jacketed by the same kind of steel-plate lining as the top and bottom of the cylinder; and the piston-rod was likewise steam-jacketed by being made hollow. All the jackets of the piston and piston-rod were in common, and were supplied with steam through a pipe seven-eighths of an inch in external diameter secured to the bottom of the piston and moving with it. This pipe passed through the bottom of the cylinder by means of a stuffing-box, beyond which it was connected to a small steam-pipe from the boiler by means of another stuffing-box; thus forming a telescopic arrangement, the pipe attached to the piston moving vertically inside of the small steam-pipe from the boiler. The water of condensation from the piston and piston-rod jackets was delivered through the telescopic pipe just described, which thus served the double purpose of supplying them with steam and of freeing them of the water resulting from its condensation. This water was drawn off through a drip-cock, and included, besides the water of condensation from the jackets, the water of condensation in the small steam-pipe extending from the boiler to the bottom of the cylinder due to its external radiation. This small steam-pipe was thoroughly covered with felt, as were also the similar pipes supplying the cylinder-jackets with steam.

The main steam-pipe supplying the cylinder delivered its steam directly into the valve-chest, between which and the steam-jackets there was no communication. With the steam there was also delivered whatever water of condensation may have been formed in the steam-pipe by external condensation, and whatever water may have been primed or carried over from the boiler mechanically by the steam. The water from the valve-chest was drawn off through a drip-pipe fitted with a stop-cock into a suitable vessel, where it was weighed separately.

The engine was situated near the boiler, from the top of which the steam-pipe, 2 inches in external diameter, rose vertically 3 feet, and then extended on an inclination upward to the valve-chest of the cylinder; the whole length of pipe being 10 feet.

The following are the principal dimensions of the engine, namely:

Number of cylinders, 1.

Diameter of cylinder, 10.0483 inches.

Stroke of piston, 24 inches.

Diameter of piston-rod, (above the piston,) 1⅝ inches.

Diameter of the steam-pipe supplying piston and piston-rod jackets, (below the piston,) ⅞ inch.

Net area of piston, exclusive of piston-rod and steam-pipe areas, 77.96305 square inches.

Space-displacement of piston per stroke, 1.08282 cubic feet.

Space in clearance and steam-passage at one end of the cylinder, 0.02218 cubic foot.

Clearance, ¼ inch.

Space between the seat of the cut-off valve and the seat of the steam-valve, 0.0175 cubic foot.

Breadth of steam-port, 1 inch.

Length of steam-port, 3¼ inches

Area of steam-port, 3¼ square inches.

FAN.

The power developed by the engine was employed in turning a fan in the still air of a very large room with numerous outlets. The fan consisted of a horizontal shaft, to which radial arms were fitted, and on them, parallel to the shaft and equispaced around it, were four boards, each 11 feet 1⅝ inches long, and 3 feet 1½ inches wide. The diameter of the fan, from outside to outside of these boards, was 12 feet ⅝ inch. The fan was driven in all the experiments, except those in columns E, F, and M, table No. 1, by a crown-gearing of cast-iron toothed wheels; the wheel on the fan-shaft having 29 teeth, and that on the engine-shaft 46 teeth; so that for each double-stroke of the engine-piston the fan made 1 586207 revolutions.

In experiments E, F, and M, table No. 1, the multiple gearing was replaced by toothed wheels of equal diameter, so that the fan made one revolution for each double-stroke of the engine-piston. In these three experiments, the fan was of the same diameter from outside to outside of the boards as in the others; but the boards, instead of being 3 feet 1½ inches wide, as in them, were only 2 feet wide.

BOILER.

The boiler supplying steam to the experimental engine was of the vertical water-tube type, with the tubes placed immediately behind and on the same level with the furnaces. The water was within the tubes and the gases of combustion around them. The water was also above and below the tubes, the latter forming a communication between the two masses.

The shell had vertical sides and ends, a semi-cylindrical top for its entire length, and a semi-cylindrical bottom for the portion of the length (5 feet 9 inches) occupied by the tubes. For the portion of the length (4 feet) occupied by the furnace there was no water-bottom, the sides of the furnace being terminated 8 inches below the top of the grate.

The shell was set in brick masonry, which formed a back smoke-connection leading the gases of combustion downward along the vertical back end into a horizontal flue beneath the shell, whence they passed into a sheet-iron chimney. Thus, the gases of combustion on leaving the furnace passed horizontally among the tubes to the back end of the shell, thence vertically down that end, and thence horizontally beneath the bottom of the shell into the chimney.

There was one furnace; it was rectangular, 2 feet 8 inches wide in the clear, 3 feet 7 inches long in the clear to the end of the water-bottom, and 2 feet 6 inches in height from the bottom of the sides to the crown. This space contained the grate-surface, 2.70 feet in length, a water bridge-wall 5 inches wide and 10 inches deep, and a combustion-chamber between it and the tubes. Below the furnace, the sides and bottom of the ash-pit are formed of brick masonry, the bottom of the ash-pit being 14 inches below the sides of the furnace. The flat water-spaces forming the sides and front of the furnace are 5 inches thick, including thicknesses of metal. The opening for the furnace-door was rectangular, 11 inches high and 15 inches wide in the clear. The top of the furnace was flat, and in the same horizontal plane with the upper tube-plate. The top of the grate-bars was 22 inches below the top of the furnace.

The tube-box was rectangular, and placed immediately behind the furnace, the upper tube-plate top of the box being a horizontal extension of the top of the furnace. The tube-box extended from the furnace clear through the back end of the boiler-shell; it was 5 feet 9 inches in length, 2 feet 8 inches in breadth, and 2 feet in height in the clear. The flat water-spaces at its sides were 5 inches thick, including thicknesses of

metal. At the back of the tube-box was a cast-iron door uncovering its whole area for sweeping the tubes.

The tube-box contained one hundred and eighty vertical water-tubes of iron, 2 inches in external diameter, 2 feet in height between the tube-plates, and made of metal one-tenth of an inch in thickness. These tubes were arranged in eighteen rows lengthwise the boiler, being 3¼ inches between axes; and in ten rows crosswise the boiler, being 3 1/16 inches between axes. The tubes were expanded over one side of their plates and riveted over the other side.

The back smoke-connection was 6 inches wide between the back end of the boiler-shell and the brick masonry; and the horizontal flue beneath the bottom of the boiler-shell was 12 inches deep at the least height, or at the center of the shell, and 2 feet 8 inches wide. By this arrangement the gases of combustion impinged upon the entire water-bottom of the shell.

The following are the principal dimensions and proportions of the boiler:

Number of boilers, 1.
Extreme length of shell of boiler, 9 feet 9 inches.
Extreme breadth of shell of boiler, 3 feet 6 inches.
Extreme height of shell of boiler, 6 feet 10 inches.
Number of furnaces, 1.
Breadth of the furnace, 2 feet 8 inches.
Length of the grate-bars, 2.7 feet.
Area of the grate-surface, 7.2 square feet.
Number of tubes, 180.
External diameter of the tubes, 2 inches.
Height of the tubes between tube-plates, 2 feet.
Space in the clear between the tubes crosswise the boiler, 1 1/16 inch.
Space in the clear between the tubes lengthwise the boiler, 3¼ inches.
Heating-surface in the tubes, calculated for their outside diameter, 188.5 square feet.
Heating-surface in the furnace, bridge-wall, and combustion-chamber, 30.4 square feet.
Heating-surface in the tube-box, 45.8 square feet.
Heating-surface in the back end of the boiler-shell, 4.8 square feet.
Heating-surface in the bottom of the boiler-shell, 19.2 square feet.
Total water-heating surface in the boiler, 288.7 square feet.
Diameter of the chimney, 1 foot 2 inches.
Height of the chimney above the level of the grates, 45 feet.
Cross-area for draught above the bridge-wall, 3.555 square feet.
Cross-area for draught through the tubes, 2.000 square feet.
Cross-area for draught at back end of boiler, 1.333 square feet.
Cross-area of the chimney, 1.069 square feet.
Ratio of the water-heating to the grate surface, 40.055 to 1.000.
Ratio of the grate-surface to the cross-area above the bridge-wall, 2.025 to 1.000.
Ratio of the grate surface to the cross-area through the tubes, 3.600 to 1.000.
Ratio of the grate-surface to the cross-area at back end of boiler, 5.400 to 1.000.
Ratio of the grate-surface to the cross-area of the chimney, 6.737 to 1.000.
Area of water-surface, 33.5 square feet.
Length traversed by the gases of combustion from the center of the furnace to exit from boiler, 17.8 feet.
Extreme height of steam-room, 2.3 feet.

EXPLANATION OF THE TABLES.

The data and results of the experiments are given in the following tables, Nos. 1 and 2. In these tables the quantities belonging to each experiment are placed in parallel columns, which are lettered for designation. These quantities are grouped under distinctive headings, and the lines containing them are numbered for facility of reference.

In table No. 1 the columns from A to F, both inclusive, contain the experiments made without steam in any of the jackets, the jackets being filled with air only, which was so confined in them that it could not be renewed from the atmosphere by circulation. These experiments were made with different initial steam-pressures in the cylinder, and different measures of expansion; the former, in experiments A, B, C, and D, being so graduated in relation to the latter, that the net horses-power developed by the engine should be very nearly the same in all. In experiments E and F a lower steam-pressure and a higher speed of piston were employed than in the four preceding ones, the latter being obtained by reducing the surface of the fan, and by making it give one revolution per double stroke of the piston, instead of 1.586207 revolutions, as in experiments A, B, C, and D. Experiments E and F were also made with different steam-pressures and measures of expansion, so graduated as to cause the engine to develop the same net horses-power in both cases. Experiments A to F, both inclusive, herefore, give the performance of the engine as an ordinary steam-engine, with a well-

clad cylinder without steam-jackets, using steam of low and medium initial pressures, with the measures of expansion due to cutting it off at one-fourth, one-half, two-thirds, and nine-tenths of the stroke of the piston from the commencement.

Experiments G to M, both inclusive, were made with steam in all the jackets. This steam had in the jackets the same pressure as in the boiler, and consequently a very much higher pressure than the initial cylinder-pressure, making the temperature in the jackets largely above the mean temperature in the cylinder. These experiments were made with different initial steam-pressures in the cylinder, and different measures of expansion, the former, in all the experiments except M, being so graduated in relation to the latter that the net horses-power developed by the engine should be very nearly the same in all, and also very nearly the same as in experiments A, B, C, and D, made with the same fan and the same speed of piston. In experiment M a lower steam-pressure and a higher speed of piston were employed than in the preceding ones from G to L, both inclusive, the latter being obtained by reducing the surface of the fan, and by making it give one revolution per double stroke of the piston instead of 1.586207 revolutions, as in those experiments. Experiment J is a repetition of experiment I. Experiments G to M, both inclusive, therefore, give the performance of the engine as a remarkably well steam-jacketed engine, for not only was the entire interior surface of the cylinder jacketed, but the piston and piston-rod also, the temperature of the steam in the jackets being at the same time largely above the temperature of even the initial steam-pressure in the cylinder, while the heat-wave had only to penetrate a thickness of one-tenth of an inch of steel. All the conditions were such as to produce the maximum effect for steam-jacketing, and far more favorable than have ever been employed before or since. As the steam was used with the same measures of expansion, and of the same initial cylinder-pressures, with the same speed of piston as in the case of experiments A to F, both inclusive, the two series of experiments determine exactly the economic gain due to the steam-jacketing for the pressures and expansions employed.

In table No. 2, experiments N, O, and P were the same as experiments H, I, and K, table No. 1, except in the one very important particular of the steam-jackets being supplied with steam from a small auxiliary boiler, instead of from the boiler furnishing steam to the cylinder. The steam of the auxiliary boiler was of enormously higher pressure than the steam of the boiler supplying the cylinder, the former being respectively 114, 118, and 127 pounds per square inch above the atmosphere, against 33.64, 27.19, and 22.45 pounds for the latter. Experiments N, O, and P, therefore, show the economic gain due to steam-jacketing with steam of enormously higher temperature than the steam supplied to the cylinder.

Experiments Q, R, S, and T were made to ascertain the effect on the economic efficiency produced by filling some of the jackets with still air, the rest being filled with steam of the boiler-pressure. Also, to ascertain the effect on the economic efficiency due to passing the water of condensation from the valve-chest through the cylinder. Experiment Q was made for the latter purpose. All the jackets were filled with steam of the boiler-pressure, and the conditions being the same as in experiment G, table No. 1, other than in the fact of the water of condensation from the valve-chest not being passed through the cylinder in the latter while it was in the former, the two experiments are strictly comparable for ascertaining the result of this difference.

In experiment R the jacket of the upper head of the cylinder was filled with still air, all the other jackets being filled with steam of the boiler-pressure. The conditions in this experiment being the same as in experiments I and J, table No. 1, other than in the fact that the jacket of the upper head of the cylinder was filled with air in the former and steam in the two latter, these experiments are strictly comparable for ascertaining the result of this difference.

In experiment S the jacket of the lower head of the cylinder was filled with still air, all the other jackets being filled with steam of the boiler-pressure. The conditions in this experiment being the same as in experiment K, table No. 1, other than in the fact that the jacket of the lower head of the cylinder was filled with still air in the former and steam in the latter, the two experiments are strictly comparable for ascertaining the results of this difference.

In experiment T the jackets of the piston and piston-rod were filled with still air, all the other jackets being filled with steam of the boiler-pressure. The conditions in this experiment being the same as in experiment G, table No. 1, other than in the fact that the jackets of the piston and piston-rod were filled with air in the former and steam in the latter, the two experiments are strictly comparable for ascertaining the result of this difference.

In all the foregoing experiments, from A, table No. 1, to T, table No. 2, both inclusive, the steam was used with condensation; but in the following experiments from U to Y, both inclusive, it was used without condensation, being exhausted directly into the atmosphere. The air-pump was disconnected from the half-beam of the engine, and the friction of the latter was consequently slightly lessened. In all these experiments, except W, all the jackets were filled with steam of the boiler-pressure. In W

the jackets of the piston and of the piston-rod were filled with still air, all the other jackets being filled with steam of the boiler-pressure. The conditions in this experiment being the same as in experiment V, other than in the fact that the jackets of the piston and piston-rod were filled with air in the former and with steam in the latter, the two experiments are strictly comparable for ascertaining the result of this difference.

In experiments U, V, X, and Y the measure of expansion with which the steam was used, the speed of the piston, and the net horses-power developed by the engine being nearly the same as in experiments G, H, I, and K, respectively, table No. 1, and all the jackets in both series being filled with steam of the boiler-pressure, the only difference being that in the former series a higher initial cylinder steam-pressure was used, and without condensation, while in the latter series a lower initial cylinder steam-pressure was used, and with condensation, these experiments are strictly comparable for ascertaining the result of this difference in the two particulars noted.

The heading of each column contains the number of times the steam was expanded In this calculation the effect of the space between the seats of the cut-off valve and the steam-valve is included, as well as the effect of the spaces in the steam-passage and clearance at one end of the cylinder.

Line 1 gives the day and hour at which each experiment commenced.

Line 2 gives the duration of each experiment in consecutive hours. All the experiments were of the same duration, 30 hours. Those in columns V and W, table No. 2, comprise two experiments, each of 30 hours' continuance. The two experiments in V were repetitions, and the results being identical, both are given in the same column. The same observations apply to the two experiments in column W, which were likewise repetitions and gave identical results.

Total quantities.—Lines 3 to 13, both inclusive, contain the total quantities ascertained. On line 3 is the total number of double strokes made by the piston of the engine, as given by a self-registering counter. The number on the counter being taken at precisely the beginning and end of the thirty hours, gave the exact number of revolutions made by the engine-shaft or of double strokes made by the steam-piston.

Line 4 gives the total number of revolutions made by the fan. In experiments E, F, and M, table No. 1, the fan had boards of only 2 feet width, and made revolution for revolution with the engine-shaft. In all the other experiments, the fan, by means of toothed wheels, was geared up to make 1.586207 revolutions per revolution of the engine-shaft, and had boards 3 feet 1¼ inches wide. With the exception of the width of the boards, all the other dimensions of the fan were the same in all the experiments. The power developed by the engine was employed in revolving the fan in still air.

Line 5 gives the total number of cubic feet of feed-water pumped from the tank into the boiler. This tank was a parallelopipedon of wood, and contained exactly 7.16059 cubic feet when filled to overflowing. Its horizontal internal dimensions were 48 inches long, 18¼ inches wide, and 14¼ inches deep. In all the experiments, except those from U to Y, both inclusive, the steam was used with condensation, and the tank was filled with water from the hot-well, having the temperature given on line 34. In experiments from U to Y, both inclusive, in which the steam was used without condensation, the tank was filled with water from the city water-works, having the temperature on line 34. A pipe with a stop-cock led from the hot-well to the top of the tank, and another pipe with a stop-cock led from the bottom of the tank to the feed-pump. The tank was filled to overflowing each time, and entirely pumped out before refilling; the exact time at which it was emptied being noted in a tabular record. The time required to fill it was inconsiderable compared with the time required to empty it. In experiments U to Y, both inclusive, the tank was filled through a pipe with a stop-cock from the city water-works, and the process was as just described.

Line 6 contains the total number of pounds of feed-water pumped from the tank into the boiler. This quantity was obtained by multiplying the quantity on line 5 by the weight in pounds of a cubic foot of water of the temperature on line 34.

Line 7 contains the total number of pounds of the water of condensation drawn from all the steam-jackets. This water flowed from the jackets through drip-pipes fitted with stop-cocks, the cocks being so adjusted as to just pass all the water without blowing steam. The water was received into suitable vessels and weighed by a delicate scales. The condensation in the steam-jackets is due externally to the loss of heat by radiation into the atmosphere, and internally to the refrigerating influence of the cylinder caused by the variations of steam-pressure and temperature therein, resulting in various condensations and re-evaporations.

Line 8 contains the total number of pounds of the water of condensation drawn from the valve-chest. This water flowed from the chest through a drip-pipe in its bottom fitted with a stop-cock so adjusted as to just pass all the water without blowing steam, and was received into a suitable vessel, where it was weighed by a delicate scales. As the steam-pipe led from the boiler directly to the valve-chest, the water obtained from the latter was due to condensation of steam in the steam-pipe and in the valve-chest by loss of heat externally radiated into the atmosphere, to which is added whatever water was primed, or brought over mechanically from the boiler mixed with the steam.

Had this water not been drawn from the valve-chest, it would have passed through the cylinder into the condenser or atmosphere, undergoing vaporization in its progress by the abstraction of heat from the metallic surfaces of the cylinder, which, being thus cooled, would require reheating at the expense of the boiler-steam.

Line 9 contains the total number of pounds of steam that entered the cylinder. When no water was drawn from the valve-chest, and no steam was used in the jackets, the entire weight of water vaporized in the boiler entered the cylinder in the form of steam, and of water of condensation from steam-pipe and valve-chest, supposing no priming to have occurred; but when the water was drawn from the valve-chest and the steam-jackets, then only so much of the water vaporized in the boiler entered the cylinder and wholly in the form of steam as remained after deducting from the weight pumped into the boiler the weights drawn from the valve-chest and jackets. Consequently, the quantity on line 9 is the remainder of the quantity on line 6 after deduction of the sum of the quantities on lines 7 and 8.

Line 10 contains the total number of pounds of anthracite consumed during the experiment, this coal being very carefully weighed on tested scales, and fired at equal intervals in equal quantities. The condition of the fire was noted at the commencement of the experiment, as well as the water-level in the boiler, and the steam-pressure, and all were left exactly the same as at the end of the experiment. The anthracite was broken into lumps of uniform size, about 1½ inches cube, and the fire was kept about 6 inches thick.

Line 11 contains the total number of pounds of refuse from the anthracite consumed during the experiment. This refuse was composed of ash, clinker, soot, &c., and was weighed in the dry state on the same scales and in the same manner as the coal. The fire-surfaces of the boiler were swept after each experiment, and the sweepings added to the refuse from the ash-pit and furnace.

Line 12 contains the total number of pounds of combustible consumed during the experiment. It is the remainder of the quantity on line 10 after deduction of the quantity on line 11.

Line 13 shows the per centum of the anthracite in refuse. It is obtained by multiplying the quantity on line 11 by 100 and dividing the product by the quantity on line 10.

Quantities per hour.—Lines 14, 15, 17, and 18 contain quantities obtained by dividing the quantities, respectively, on lines 6, 9, 10, and 12 by the quantity on line 2.

Line 16 shows the per centum of the steam evaporated in the boiler that entered the cylinder. It is obtained by multiplying the quantity on line 6 by 100 and dividing the product by the quantity on line 9.

Lines 19 and 21 contain, respectively, the quotients of the quantities on lines 17 and 18 divided by 7.2, (the number of square feet of grate-surface.)

Lines 20 and 22 contain, respectively, the quotients of the quantities on lines 17 and 18 divided by 288.7, (the number of square feet of water-heating surface.)

Engine.—The quantities on lines 23 and 24 are obtained, respectively, by the division of the quantities on lines 3 and 4 by the product of the quantity on line 2 multiplied by 60.

Line 25 contains the mean steam-pressure in the boiler supplying the cylinder, in pounds per square inch above the atmosphere. This pressure scarcely varied during an experiment, the rate of combustion being controlled by a damper in the flue regulated by the pressure of the steam itself. It was noted at regular intervals from a tested mercurial gauge, and recorded in an appropriate column of the tabular record.

Line 26 shows the difference between the boiler-pressure and the initial cylinder-pressure, in pounds per square inch. It was obtained by adding the atmospheric pressure in pounds per square inch deduced from the quantity on line 29, to the quantity on line 25, and deducting from the sum the quantity on line 37.

Line 27 shows the fraction of the stroke of the piston completed when the steam was cut off. The cut-off valve was adjusted from indicator-diagrams, so as to close the opening at exactly the fractions of the stroke of the piston given. The heading of each column states the number of times the steam was expanded for the point of cutting off on line 27.

Line 28 shows the mean vacuum in the condenser in inches of mercury during the experiment, as given by a mercurial gauge and recorded at regular intervals in an appropriate column of the tabular record. It scarcely varied during an experiment, and is corrected for temperature. By "vacuum in the condenser" is meant, of course, the pressure there below the atmospheric pressure.

Line 29 shows the mean height of the barometer in inches of mercury during an experiment, corrected for temperature.

Line 30 (table No. 2 only) contains the steam-pressure in pounds per square inch in the small auxiliary boiler supplying steam of very high pressure to the steam-jackets in experiments N, O, and P, table No. 2. It was obtained from a tested spring-gauge and did not vary sensibly during an experiment.

Temperatures.—Lines 31 and 32 (32 in table No. 2 only) contain respectively the temperatures normal to the steam-pressures on lines 25 and 30, according to Regnault.

Lines 33, 34, 35, and 36 contain respectively the mean temperature of the engine-room, of the feed-water in the tank, of the hot-well, and of the injection-water, taken from common thermometers at regular intervals and entered in appropriate columns in the tabular record.

Steam-pressures in the cylinder per indicator.—Lines 37 to 43, both inclusive, contain the mean steam-pressures in the cylinder as given by a tested and delicate indicator, (not of the parallel-motion kind.) An indicator-diagram was taken from each end of the cylinder every twenty minutes, making sixty double diagrams to each experiment. Each diagram was divided into ten equal parts lengthwise, and from the center of each division a perpendicular to the atmospheric line was erected, and on these perpendiculars the pressures were measured to the nearest tenth of a pound, and the means taken. All the pressures, with the exception of those on lines 41, 42, and 43, were measured from the atmospheric line and then reduced to pressures above the zero line, or line of no pressure, by addition to or subtraction from, as the case required, the atmospheric pressure in pounds per square inch deduced from the quantity on line 29.

Line 37 shows the initial steam-pressure in the cylinder above zero. Line 38 shows the steam-pressure in the cylinder at the moment the cut-off valve closed, and line 39 shows it at the moment the piston reached the end of its stroke. Line 40 shows the back-pressure in the cylinder against the piston; that is to say, the pressure there of the uncondensed vapor above zero resisting the movement of the piston. All these pressures are in pounds per square inch.

Line 41 contains the mean gross effective pressure upon the piston in pounds per square inch. It represents the area of the diagram, and shows the pressure required to overcome the entire resistance except that of the back-pressure. It thus equilibrates the resistance of the load, of the friction of the load, and of the friction of the engine, *per se*, or unloaded. Line 42 contains the mean total pressure upon the piston in pounds per square inch, and is the pressure equilibrating all the resistances to the movement of the piston, be they what they may, including the back-pressure, the load, the friction of the load, and the friction of the engine, *per se*. It is the sum of the quantities on lines 40 and 41. Line 43 contains the mean net pressure upon the piston in pounds per square inch. The pressure required to work the engine, *per se*, or with the fan disengaged from it, was, as a mean of many trials, 3 pounds per square inch of piston by the indicator, which being deducted from the quantity on line 41 leaves the quantity on line 43. The net pressure consequently only equilibrates the resistances external to the engine; that is to say, those of the load and of the friction of the load.

Power—absolute.—The speed of the piston in feet per minute is obtained by multiplying the quantity on line 23 by 4, which product multiplied by the number of square inches (77.96305) in the piston and divided by 33000, gives a constant that, being in its turn multiplied by the quantities on lines 41, 42, and 43, gives, respectively, the quantities on lines 44, 45, and 46.

Line 44 contains the gross effective horses-power developed by the engine, and is commonly called the indicated horse-power. It overcomes the external load, the friction of the load, and the friction of the engine, *per se*. Line 45 contains the total horses-power developed by the engine, and expresses the entire dynamical effect produced by the steam. It overcomes the external load, the friction of the load, the friction of the engine, *per se*, and the back pressure. Line 46 contains the net horses-power developed by the engine, and overcomes only the external load and its friction. It is the portion of the total power developed by the engine which is commercially useful or expended in doing external work, the remaining portion being expended uselessly in doing work internal to but inseparable from the engine.

Economic.—Lines 47 to 58, both inclusive, show the economic performance of the engine, expressed by the cost of the horse-power in pounds of feed-water or of steam, and in pounds of fuel consumed per hour.

Lines 47, 48, and 49 contain, respectively, the cost of the gross effective, total, and net horse-power in pounds of feed-water consumed per hour; that is to say, in pounds of the feed-water pumped from the tank into the boiler. These quantities are given by the division, respectively, of that on line 14 by those on lines 44, 45, and 46.

Lines 50, 51, and 52 contain, respectively, the cost of the gross effective, total, and net horse-power in pounds of steam that entered the cylinder per hour; that is to say, in pounds of steam exclusive of the steam condensed in the valve-chest and jackets. These quantities are given by the division, respectively, of that on line 15 by those on lines 44, 45, and 46.

Lines 53, 54, and 55 contain respectively the cost of the gross effective, total, and net horse-power in pounds of anthracite consumed per hour. These quantities are given by the division respectively of that on line 17 by those on lines 44, 45, and 46.

Lines 56, 57, and 58 contain respectively the cost of the gross effective, total, and net

horse-power in pounds of combustible consumed per hour. These quantities are given by the division respectively of that on line 18 by those on lines 44, 45, and 46.

Condensation.—Line 59 contains the total number of pounds of steam discharged from the cylinder into the condenser or into the atmosphere, calculated from the pressure of the steam at the end of the stroke of the piston. This quantity is simply the weight of steam present in the cylinder when the piston had completed its stroke. It does not include the water of condensation present in the cylinder at the same time, and which is re-vaporized during the exhaust-stroke of the piston, passing into the condenser or into the atmosphere during the time of making that stroke. This re-vaporization is effected under the reduced pressure by the heat of the cylinder and the heat contained in the water. The quantity on line 59 is obtained by multiplying the weight in pounds of a cubic foot of steam having the pressure on line 39, by the space (2.21 cubic feet) filled with that steam per double stroke of piston, and this product by the quantity on line 3.

Line 60 contains the total number of pounds of steam condensed in the boiler and cylinder to furnish the heat transmuted into the total power developed by the engine, according to Joule's equivalent. A horse-power is 33,000 foot-pounds of work, and the thermal equivalent of 772 foot-pounds being one Fahrenheit unit, or the quantity of heat required to raise the temperature of one pound of water under the atmospheric pressure at the temperature of 32 degrees Fahrenheit, one degree; the thermal equivalent of a horse-power is ($\frac{33000}{772}$=) 42.7461 Fahrenheit units. For every total horse-power developed by the engine, this quantity of heat is abstracted from the steam and a proportionate quantity of the latter undergoes condensation, this condensation taking place uniformly throughout the whole mass of the steam from the surface of the water in the boiler to the piston in the cylinder at the point of its stroke when the cut-off valve closes, after which closing the condensation takes place entirely in the cylinder. In this condensation of the steam, the condensed portion can lose only its latent heat, because the resulting water of condensation remains at the boiling-point normal to the pressure which has undergone no change. Therefore, to supply the heat transmuted into one total horse-power, as much weight of steam must be evaporated in the boiler as there are 42.7461 units of heat in its latent heat, which weight is obtained in pounds by dividing 42.7461 by the latent heat. Hence, the quantity on line 60 equals the quotient of the division of 42.7461 by the latent heat of the steam of the boiler-pressure on line 25, multiplied by the number of total horses-power developed by the engine on line 45, and the product multiplied by the number of minutes in the hours on line 2.

When saturated steam is used from the boiler, either with or without steam-jacketing of the cylinder, the water of condensation due to the abstraction of the latent heat transmuted into the power developed by the engine, remains suspended in the mass of steam throughout which it is distributed with perfect uniformity in exceedingly minute particles, the mixed steam and water forming a very delicate fog or mist. After a long while, the water particles would separate from the steam by gravity and be deposited upon the surfaces beneath; but in the operations of a steam-engine, this time or the remotest approximation to it is utterly wanting, and the intimate mixture of the minute particles of water and of steam which fill all the steam-spaces of the boiler, steam-pipe, valve-chest, and cylinder, passes *en masse* into the condenser or atmosphere without separation.

Line 61 contains the sum of the quantities on lines 59 and 60, and shows the number of pounds of water vaporized in the boiler accounted for by the indicator.

Line 62 shows the per centum of the water vaporized in the boiler not accounted for by the indicator. It is the per centum which the remainder of the quantity on line 6, after subtracting the quantity on line 61, is of the quantity on line 6. In the case of an ordinary unjacketed steam-engine, the whole of this enormous per centum is found condensed upon the interior surfaces of the cylinder when the exhaust-port opens, and is re-vaporized thence by its contained heat and by the heat of the cylinder-surfaces, during the time the cylinder is in communication with the condenser and under the reduced pressure thus produced.

Line 63 shows the per centum of the water vaporized in the boiler not accounted for by the indicator and by the water of condensation drawn from the valve-chest and steam-jackets of the cylinder. It is the per centum which the remainder of the quantity on line 6, after subtracting the sum of the quantities on lines 7, 8, and 61, is of the quantity on line 6. In the case of a *perfectly* steam-jacketed engine, having steam in the jackets of considerably higher pressure than the initial steam-pressure in the cylinder, and with the water of condensation drawn from the valve-chest so as not to enter the cylinder, the whole of this very large per centum is found condensed upon the interior surfaces of the cylinder, and is revaporized thence by its contained heat and by the heat of the cylinder-surfaces, during the time the cylinder is in communication with the condenser and under the reduced pressure thus produced.

Line 64 contains the per centum of the steam evaporated in the boiler condensed in the boiler and cylinder to furnish the heat transmuted into the total power developed by the engine. It is the per centum which the quantity on line 60 is of the quantity

	Height of the barometer in inches of mercury	0.25 28.02 29.45	0.50 26.54 29.79	0.66+ 29.67 29.80	0.99 26.27 29.73	0.25 27.62 29.89	0.90 27.46 30.19
	TEMPERATURES.						
31	Temperature, in degrees Fahrenheit, of the steam in the boiler	289.2	278.0	265.3	263.9	282.0	283.5
33	Temperature, in degrees Fahrenheit, of the engine-room	74.9	72.2	76.3	75.8	62.9	55.9
34	Temperature, in degrees Fahrenheit, of the feed-water in the tank	104.4	107.2	107.2	108.2	87.3	97.2
35	Temperature, in degrees Fahrenheit, of the hot-well	107.6	110.1	110.0	111.3	90.1	101.2
36	Temperature, in degrees Fahrenheit, of the injection-water	62.0	62.0	60.0	60.0	40.0	40.0
	STEAM-PRESSURES IN CYLINDER, PER INDICATOR.						
37	In pounds, per square inch above zero, at commencement of stroke of piston	50.59	37.70	33.29	30.50	20.98	15.23
38	In pounds, per square inch above zero, at point of cutting off the steam	42.48	28.69	25.78	25.88	15.73	12.40
39	In pounds, per square inch above zero, at the end of the stroke of the piston	14.27	17.70	18.55	22.95	8.53	11.59
40	In pounds, per square inch above zero, against the piston during its stroke	4.04	4.03	4.30	4.62	4.99	4.55
41	Mean gross effective pressure upon the piston, in pounds, per square inch	24.25	24.83	23.75	23.87	7.28	9.15
42	Mean total pressure upon the piston, in pounds, per square inch	28.29	28.86	28.05	28.49	12.27	13.70
43	Mean net pressure upon the piston, in pounds, per square inch	21.25	21.83	20.75	20.87	4.28	6.15
	POWER.						
	Absolute:						
44	Gross effective horses-power developed by the engine	9.8838	10.1193	9.6789	9.7332	4.2251	5.2231
45	Total horses-power developed by the engine	11.1505	11.7617	11.4313	11.6171	7.1211	7.8204
46	Net horses-power developed by the engine	8.6611	8.8967	8.4563	8.5100	2.4840	3.5106
	Economic:						
47	Pounds of feed-water consumed per hour per gross effective horse-power	43.6658	47.6219	51.2136	56.5039	76.4080	78.6556
48	Pounds of feed-water consumed per hour per total horse-power	38.7056	40.9890	43.3635	47.3411	45.3341	59.5328
49	Pounds of feed-water consumed per hour per net horse-power	47.7521	54.1888	58.6179	64.0386	129.5611	117.0242
50	Pounds of steam that entered the cylinder, consumed per hour per gross effective horse-power	43.6658	47.6219	51.2136	56.5039	73.8591	77.6679
51	Pounds of steam that entered the cylinder, consumed per hour per total horse-power	38.7056	40.9890	43.3635	47.3411	43.8220	51.8729
52	Pounds of steam that entered the cylinder, consumed per hour per net horse-power	47.7521	54.1888	58.6179	64.0386	125.6029	115.5549
53	Pounds of anthracite consumed per hour per gross effective horse-power	4.9003	5.2606	5.8030	6.6713	8.5442	8.6922
54	Pounds of anthracite consumed per hour per total horse-power	4.3436	4.5260	4.9135	5.5895	5.0694	5.8053
55	Pounds of anthracite consumed per hour per net horse-power	5.5920	5.9835	6.6420	7.6302	14.5330	12.9038
56	Pounds of combustible consumed per hour per gross effective horse-power	4.1988	4.5260	4.8249	5.5994	7.2188	7.4222
57	Pounds of combustible consumed per hour per total horse-power	3.7218	3.8940	4.0852	4.7774	4.2830	4.9571
58	Pounds of combustible consumed per hour per net horse-power	4.7915	5.1480	5.5225	6.4042	12.2788	11.0427
	CONDENSATION.						
59	Total number of pounds of steam discharged from the cylinder into the condenser, calculated from the pressure of the steam at the end of the stroke of the piston	6,320.4754	7,801.6931	8,161.6468	10,021.5011	5,519.1782	7,402.6290
60	Total number of pounds of steam condensed in the boiler and cylinder to furnish the heat transmuted into the total horses power developed by the engine, according to Joule's equivalent	942.2657	985.1158	948.0639	961.2325	598.3104	657.8614

* Steam used with condensation, and different measures of expansion.

TABLE No. 1.—*Containing the data and results of the experiments made by Henry Watermann, in 1864, at the Clinton Foundery, No. 239 Cherry street, New York City, on the economic efficiency of steam used with condensation and different measures of expansion for the production of power in a steam-engine, the cylinder of which was jacketed on top, bottom, and sides, with its piston and piston-rod also jacketed; the experiments being made both with and without steam in the jackets.*

No. of line.		No steam in the jacket.*					
	Designation of the experiment	A	B	C	D	E	F
	Number of times the steam was expanded	3.6165	1.9317	1.4739	1.1068	3.6165	1.1068
1	Date of commencing experiment	11 a. m. May 20	11 a. m. May 24	9 a. m. May 19	10 a. m. May 17	9 a. m. Mar. 17	9 a. m. Mar. 21
2	Duration of experiment in consecutive hours	30.	30.	30.	30.	30.	30.
	TOTAL QUANTITIES.						
3	Total number of double strokes made by the engine's piston	77, 364.	77, 627.	77, 625.	77, 668.	110, 546.	110, 634.
4	Total number of revolutions made by the fan	122, 715. 3183	123, 132. 4908	123, 129. 3184	123, 197. 5253	110, 546. 0000	110, 634. 0000
5	Total number of cubic feet of feed-water pumped from the tank into the boiler	205. 8197	233. 7646	240. 3552	266. 7320	155. 9490	198. 7859
6	Total number of pounds of feed-water pumped from the tank into the boiler	12, 947. 5987	14, 463. 0182	14, 870. 7793	16, 499. 0078	9, 684. 8692	12, 324. 7619
7	Total number of pounds of the water of condensation drawn from the steam-jacket	.....	.....	.....	.....	.....	.....
8	Total number of pounds of the water of condensation drawn from the valve-chest of the cylinder	.....	.....	.....	.....	323. 00	154. 75
9	Total number of pounds of steam that entered the cylinder	12, 947. 5987	14, 463. 0182	14, 870. 7793	16, 499. 0078	9, 361. 8692	12, 170. 0119
10	Total number of pounds of anthracite consumed	1, 453.	1, 597.	1, 685.	1, 948.	1, 083.	1, 362.
11	Total number of pounds of refuse from the anthracite in ash, clinker, &c	208.	223.	284.	313.	168.	199.
12	Total number of pounds of combustible consumed	1, 245.	1, 374.	1, 401.	1, 635.	915.	1, 163.
13	Per centum of the anthracite in refuse of ash, clinker, &c	14. 32	13. 96	16. 86	16. 07	15. 51	14. 61
	QUANTITIES PER HOUR.						
14	Pounds of feed-water pumped from the tank into the boiler per hour	431. 5866	482. 1006	495. 6926	549. 9669	322. 8290	410. 8254
15	Pounds of steam that entered the cylinder per hour	431. 5866	482. 1006	495. 6926	549. 9669	312. 0623	405. 6671
16	Per centum of the steam evaporated in the boiler that entered the cylinder	100. 00	100. 00	100. 00	100. 00	96 66	98. 74
17	Pounds of anthracite consumed per hour	48. 4333	53. 2333	56. 1667	64. 9333	36. 1000	45. 4000
18	Pounds of combustible consumed per hour	41. 5000	45. 8000	46. 7000	54. 5000	30. 5000	38. 7667
19	Pounds of anthracite consumed per hour per square foot of grate-surface	6. 7268	7. 3935	7. 8009	9. 0185	5. 0139	6. 3055
20	Pounds of anthracite consumed per hour per square foot of heating-surface	0. 1678	0. 1844	0. 1946	0. 2249	0. 1250	0. 1573
21	Pounds of combustible consumed per hour per square foot of grate-surface	5. 7639	6. 3611	6. 4861	7. 5694	4. 2361	5 3842
22	Pounds of combustible consumed per hour per square foot of heating-surface	0. 1437	0. 1586	0. 1617	0. 1888	0. 1056	0. 1343
	ENGINE.						
23	Number of double strokes of engine's piston made per minute	43. 130	43. 126	43. 125	43. 149	61. 414	61. 463
24	Number of revolutions of the fan made per minute	68. 175	68. 407	68. 405	68. 443	61. 414	61. 463
25	Steam-pressure in the boiler, in pounds, per square inch above the atmosphere	42. 50	33. 13	24. 16	23. 29	36. 22	37. 32
26	Difference between the steam-pressure in the boiler and in the cylinder at commencement of stroke, in pounds per square inch	6. 37	10. 06	5. 50	7. 38	29. 92	36. 91

27	Fraction of the stroke of the piston completed when the steam was cut off	0.95	0.50	0.66+	0.90	0.95	0.90
28	Vacuum in the condenser in inches of mercury	26.09	26.54	26.67	26.27	27.02	27.40
29	Height of the barometer in inches of mercury	29.45	29.79	29.80	29.79	29.89	30.18
	TEMPERATURES.						
31	Temperature, in degrees Fahrenheit, of the steam in the boiler	289.2	278.0	265.3	263.9	282.0	283.5
33	Temperature, in degrees Fahrenheit, of the engine-room	73.9	72.2	76.3	75.8	62.9	55.9
34	Temperature, in degrees Fahrenheit, of the feed-water in the tank	104.4	107.2	107.2	108.2	87.3	97.2
35	Temperature, in degrees Fahrenheit, of the hot-well	107.6	110.1	110.0	111.3	90.1	101.2
36	Temperature, in degrees Fahrenheit, of the injection-water	62.0	62.0	60.0	60.0	40.0	40.0
	STEAM-PRESSURES IN CYLINDER, PER INDICATOR.						
37	In pounds, per square inch above zero, at commencement of stroke of piston	50.59	37.70	33.29	30.50	20.98	15.23
38	In pounds, per square inch above zero, at point of cutting off the steam	42.48	28.69	25.78	25.88	15.73	12.40
39	In pounds, per square inch above zero, at the end of the stroke of the piston	14.27	17.70	18.55	22.95	8.53	11.59
40	In pounds, per square inch above zero, against the piston during its stroke	4.04	4.03	4.30	4.62	4.99	4.55
41	Mean gross effective pressure upon the piston, in pounds, per square inch	24.25	24.83	23.75	23.87	7.28	9.15
42	Mean total pressure upon the piston, in pounds, per square inch	28.29	28.86	28.05	28.49	12.27	13.70
43	Mean net pressure upon the piston, in pounds, per square inch	21.25	21.83	20.75	20.87	4.28	6.15
	POWER.						
	Absolute:						
44	Gross effective horses-power developed by the engine	9.8838	10.1193	9.6789	9.7332	4.2251	5.2231
45	Total horses-power developed by the engine	11.1505	11.7617	11.4313	11.6171	7.1211	7.8204
46	Net horses-power developed by the engine	8.6611	8.8967	8.4563	8.5100	2.4840	3.5106
	Economic:						
47	Pounds of feed-water consumed per hour per gross effective horse-power	43.6658	47.6219	51.2136	56.5039	76.4080	78.6556
48	Pounds of feed-water consumed per hour per total horse-power	38.7056	40.9890	43.3635	47.3411	45.3341	52.5328
49	Pounds of feed-water consumed per hour per net horse-power	47.7521	54.1888	58.6179	64.0386	129.5611	117.0242
50	Pounds of steam that entered the cylinder, consumed per hour per gross effective horse-power	43.6658	47.6219	51.2136	56.5039	73.8591	77.6679
51	Pounds of steam that entered the cylinder, consumed per hour per total horse-power	38.7056	40.9890	43.3635	47.3411	43.8220	51.8729
52	Pounds of steam that entered the cylinder, consumed per hour per net horse-power	47.7521	54.1888	58.6179	64.0386	125.6029	115.5549
53	Pounds of anthracite consumed per hour per gross effective horse-power	4.9003	5.2606	5.8030	6.6713	8.5442	8.6922
54	Pounds of anthracite consumed per hour per total horse-power	4.3436	4.5260	4.9135	5.5895	5.0694	5.8053
55	Pounds of anthracite consumed per hour per net horse-power	5.5920	5.9835	6.6420	7.6302	14.5330	12.9038
56	Pounds of combustible consumed per hour per gross effective horse-power	4.1988	4.5260	4.8249	5.5994	7.2188	7.4222
57	Pounds of combustible consumed per hour per total horse-power	3.7218	3.8940	4.0852	4.7774	4.2830	4.9571
58	Pounds of combustible consumed per hour per net horse-power	4.7915	5.1480	5.5225	6.4042	12.2788	11.0427
	CONDENSATION.						
59	Total number of pounds of steam discharged from the cylinder into the condenser, calculated from the pressure of the steam at the end of the stroke of the piston	6,320.4754	7,801.6931	8,161.6468	10,021.5011	5,519.1782	7,402.6290
60	Total number of pounds of steam condensed in the boiler and cylinder to furnish the heat transmuted into the total horses power developed by the engine, according to Joule's equivalent	942.2657	985.1158	948.0639	961.2325	598.3104	657.8614

* Steam used with condensation, and different measures of expansion.

TABLE No. 1.—*Containing the data and results of the experiments made by Henry Watermann, in 1864, &c.*—Continued.

No. of line.		No steam in the jacket.*					
	Designation of the experiment	A	B	C	D	E	F
	Number of times the steam was expanded	3.6165	1.9317	1.4739	1.1068	3.6165	1.1068
	CONDENSATION—Continued.						
61	Sum of the above two quantities, or the number of pounds of steam accounted for by the indicator	7,262.7411	8,786.8089	9,109.7107	10,982.7336	6,117.4886	8,060.4904
62	Per centum of the steam evaporated in the boiler not accounted for by the indicator	43.91	39.25	38.74	33.43	35.80	34.60
63	Per centum of the steam evaporated in the boiler not accounted for by the indicator and by the water of condensation drawn from the steam-jacket and valve-chest	.....	.....	.....	.....	34.65	33.77
64	Per centum of the steam evaporated in the boiler, condensed in the boiler and cylinder to furnish the heat transmuted into the total horses-power developed by the engine	7.28	6.81	6.38	5.83	6.18	5.34
65	Per centum of the steam evaporated in the boiler, condensed in the jacket	.....	.....	.....	.....	.....	.....
	VAPORIZATION.						
	Absolute:						
66	Pounds of water which would have been vaporized in the boiler had the feed-water been supplied at the temperature of 100 degrees Fahrenheit and vaporized under the pressure of 14.68757 pounds per square inch, instead of the experimental temperatures and pressures	13,177.2741	14,636.1568	15,004.7330	16,615.0459	9,990.7389	12,606.0052
67	Pounds of water which would have been vaporized in the boiler had the feed-water been supplied at the temperature of 212 degrees Fahrenheit, and vaporized under the pressure of 14.68757 pounds per square inch, instead of the experimental temperatures and pressures	14,716.9161	16,346.2538	16,747.5403	18,546.3473	11,158.2701	14,079.1599
	Economic:						
68	Pounds of water vaporized from 100 degrees Fahrenheit by one pound of anthracite	9,0690	9.1648	8.9049	8.5293	9.2250	9.2555
69	Pounds of water vaporized from 100 degrees Fahrenheit by one pound of combustible	10.5841	10.6922	10.7100	10.1621	10.9189	10.8392
70	Pounds of water vaporized from 212 degrees Fahrenheit by one pound of anthracite	10.1287	10.2356	9.9392	9.5207	10.3022	10.3371
71	Pounds of water vaporized from 212 degrees Fahrenheit by one pound of combustible	11.8208	11.8968	11.9540	11.3433	12.1948	12.1059

* Steam used with condensation, and different measures of expansion.

	Economic:							
47	Pounds of feed-water consumed per hour per gross effective horse-power	30. 9791	31. 8212	34. 1222	33. 6931	38. 3190	44. 0390	53. 7364
48	Pounds of feed-water consumed per hour per total horse-power	28. 0250	28. 5128	30. 5857	30. 0259	34. 2660	38. 9017	38. 5622
49	Pounds of feed-water consumed per hour per net horse-power	35. 2482	36. 1904	39. 0272	38. 2730	43. 7478	49. 5220	80. 9677
50	Pounds of steam that entered the cylinder, consumed per hour per gross effective horse-power	27. 4614	28. 4731	30. 8963	30. 4228	35. 3504	41. 7686	50. 9191
51	Pounds of steam that entered the cylinder, consumed per hour per total horse-power	24. 8437	25. 5125	27. 6941	27. 0359	31. 6116	36. 2501	36. 5403
52	Pounds of steam that entered the cylinder, consumed per hour per net horse-power	31. 2009	32. 3877	35. 3376	35. 6703	43. 5773	46. 0283	76. 7210
53	Pounds of anthracite consumed per hour per gross effective horse-power	3. 3486	3. 5345	3. 7133	3. 6161	4. 1709	4. 9354	6. 1319
54	Pounds of anthracite consumed per hour per total horse-power	3. 0294	3. 1669	3. 3199	3. 2230	3. 7400	4. 2822	4. 4002
55	Pounds of anthracite consumed per hour per net horse-power	3. 8100	4. 0204	4. 2479	4. 1064	4. 7617	5. 4387	9. 2388
56	Pounds of combustible consumed per hour per gross effective horse power	2. 8141	3. 0404	3. 2010	3. 1135	3. 6702	4. 2423	5. 2686
57	Pounds of combustible consumed per hour per total horse-power	2. 5727	2. 7508	2. 8693	2. 7757	3. 2820	3. 6809	3. 7808
58	Pounds of combustible consumed per hour per net horse-power	3. 2356	3. 4921	3. 6612	3. 5367	4. 3061	4. 6749	7. 9360
	CONDENSATION.							
59	Total number of pounds of steam discharged from the cylinder into the condenser, calculated from the pressure of the steam at the end of the stroke of the piston	5, 786. 8250	6, 165. 1500	6, 834. 4590	7, 199. 9232	8, 004. 7679	9, 692. 6092	6, 739. 4999
60	Total number of pounds of steam condensed in the boiler and cylinder to furnish the heat transmuted into the total horses-power developed by the engine, according to Joule's equivalent	949. 5253	955. 7700	911. 7039	960. 8778	923. 2817	910. 7886	606. 2581
61	Sum of the above two quantities, or the number of pounds of steam accounted for by the indicator	6, 736. 3503	7, 120. 9200	7, 746. 1559	8, 160. 8010	8, 928. 0496	10, 603. 3978	7, 345. 7580
62	Per centum of the steam evaporated in the boiler not accounted for by the indicator	28. 26	26. 29	22. 36	20. 95	21. 18	17. 41	11. 96
63	Per centum of the steam evaporated in the boiler not accounted for by the indicator and by the water of condensation drawn from the steam-jacket and valve-chest	19. 07	17. 62	14. 26	12. 45	14 57	11. 14	7. 08
64	Per centum of the steam evaporated in the boiler, condensed in the boiler and cylinder to furnish the heat transmuted into the total horses-power developed by the engine	10. 11	9. 89	9. 14	9. 31	8. 15	7. 09	7. 27
65	Per centum of the steam evaporated in the boiler, condensed in the jacket	6. 33	5. 86	4. 69	4. 98	4. 37	3. 61	4. 46
	VAPORIZATION.							
	Absolute:							
66	Pounds of water which would have been vaporized in the boiler had the feed-water been supplied at the temperature of 100 degrees Fahrenheit and vaporized under the pressure of 14.68757 pounds per square inch, instead of the experimental temperatures and pressures	9, 591. 1699	9, 854. 1346	10, 133. 8993	10, 498. 9809	11, 507. 8594	13, 082. 7920	8, 608. 2581

* Steam used with condensation, and different measures of expansion.

TABLE NO. 1.—*Containing the data and results of the experiments made by Henry Watermann, in 1864, &c.*—Continued.

No. of line.		Steam of boiler-pressure in the jacket.*						
	Designation of the experiment	G	H	I	J	K	L	M
	Number of times the steam was expanded	3.6165	3.0793	1.9317	1.9317	1.3178	1.1068	1.1068
	ENGINE.							
23	Number of double strokes of engine's piston made per minute	43.164	43.144	43.209	43.111	43.124	43.176	61.396
24	Number of revolutions of the fan made per minute	68.467	68.436	68.538	68.382	68.403	68.494	61.396
25	Steam-pressure in the boiler in pounds per square inch above the atmosphere	49.48	44.03	34.19	34.90	33.45	24.63	36.83
26	Difference between the steam-pressure in the boiler and in the cylinder at commencement of stroke, in pounds per square inch	13.98	14.49	14.39	13.46	16.67	10.64	37.87
27	Fraction of the stroke of the piston completed when the steam was cut off	0.25	0.30	0.50	0.50	0.75	0.90	0.90
28	Vacuum in the condenser in inches of mercury	26.53	26.35	26.28	25.90	26.32	27.30	27.45
29	Height of the barometer in inches of mercury	29.85	29.96	29.73	29.80	29.85	29.81	29.78
	TEMPERATURES.							
31	Temperature, in degrees Fahrenheit, of the steam in the boiler	297.0	291.2	279.3	280.3	278.5	266.0	282.7
33	Temperature, in degrees Fahrenheit, of the engine-room	87.6	85.0	91.6	83.3	87.9	72.3	66.7
34	Temperature, in degrees Fahrenheit, of the feed-water in the tank	102.8	102.5	103.6	102.5	103.1	95.9	87.3
35	Temperature, in degrees Fahrenheit, of the hot-well	106.5	105.6	106.9	106.3	105.7	98.9	90.5
36	Temperature, in degrees Fahrenheit, of the injection-water	76.0	77.0	76.0	76.0	76.0	56.0	40.0
	STEAM-PRESSURE IN CYLINDER, PER INDICATOR.							
37	In pounds, per square inch above zero, at commencement of stroke of piston	50.16	44.25	34.40	36.07	31.44	28.63	13.58
38	In pounds, per square inch above zero, at point of cutting off the steam	43.86	37.80	28.30	29.14	25.24	25.60	12.07
39	In pounds, per square inch above zero, at the end of the stroke of the piston	12.96	13.85	15.40	16.30	18.18	22.15	10.52
40	In pounds, per square inch above zero, against the piston during its stroke	2.61	2.88	2.76	3.05	2.86	3.56	3.51
41	Mean gross effective pressure upon the piston, in pounds, per square inch	24.77	24.82	23.87	25.07	24.18	23.34	8.92
42	Mean total pressure upon the piston, in pounds, per square inch	27.38	27.70	26.63	28.12	27.04	26.90	12.43
43	Mean net pressure upon the piston, in pounds, per square inch	21.77	21.82	20.87	22.07	21.18	20.34	5.92
	POWER.							
	Absolute:							

47	Pounds of feed-water consumed per hour per gross effective horse-power	30. 9791	31. 8912	34. 1222	33. 6931	38. 3190	44. 9390	53. 7364
48	Pounds of feed-water consumed per hour per total horse-power	28. 0250	28. 5128	30. 5857	30. 0859	34. 2660	38. 9917	38. 5622
49	Pounds of feed-water consumed per hour per net horse-power	35. 2482	36. 1964	39. 0272	38. 2730	43. 7478	49. 5220	80. 9677
50	Pounds of steam that entered the cylinder, consumed per hour per gross effective horse-power	27. 4614	28. 4731	30. 8963	30. 4228	35. 3504	41. 7686	50. 9191
51	Pounds of steam that entered the cylinder, consumed per hour per total horse-power	24. 8437	25. 5125	27. 6941	27. 0359	31. 6116	36. 2501	36. 5403
52	Pounds of steam that entered the cylinder, consumed per hour per net horse-power	31. 2009	32. 3877	35. 3376	35. 6703	43. 5773	46. 0283	76. 7210
53	Pounds of anthracite consumed per hour per gross effective horse-power	3. 3486	3. 5345	3. 7133	3. 6161	4. 1709	4. 9354	6. 1319
54	Pounds of anthracite consumed per hour per total horse-power	3. 0294	3. 1669	3. 3199	3. 2230	3. 7300	4. 2822	4. 4002
55	Pounds of anthracite consumed per hour per net horse-power	3. 8100	4. 0214	4. 2179	4. 1064	4. 7617	5. 4387	9. 2388
56	Pounds of combustible consumed per hour per gross effective horse power	2. 8141	3. 0404	3. 2010	3. 1135	3. 6702	4. 2423	5. 2686
57	Pounds of combustible consumed per hour per total horse-power	2. 5727	2. 7508	2. 8693	2. 7757	3. 2820	3. 6809	3. 7808
58	Pounds of combustible consumed per hour per net horse-power	3. 2356	3. 4921	3. 6612	3. 5367	4. 3061	4. 6749	7. 9360
	CONDENSATION.							
59	Total number of pounds of steam discharged from the cylinder into the condenser, calculated from the pressure of the steam at the end of the stroke of the piston	5, 786. 8250	6, 165. 1500	6, 834. 4520	7, 199. 9232	8, 004. 7679	9, 692. 6092	6, 739. 4999
60	Total number of pounds of steam condensed in the boiler and cylinder to furnish the heat transmuted into the total horses-power developed by the engine, according to Joule's equivalent	949. 5253	955. 7700	911. 7039	960. 8778	923. 2817	910. 7886	606. 2581
61	Sum of the above two quantities, or the number of pounds of steam accounted for by the indicator	6, 736. 3503	7, 120. 9200	7, 746. 1559	8, 160. 8010	8, 928. 0496	10, 603. 3978	7, 345. 7580
62	Per centum of the steam evaporated in the boiler not accounted for by the indicator	28. 26	26. 29	22. 36	20. 95	21. 18	17. 41	11. 96
63	Per centum of the steam evaporated in the boiler not accounted for by the indicator and by the water of condensation drawn from the steam-jacket and valve-chest	19. 07	17. 62	14. 26	12. 45	14 57	11. 14	7. 08
64	Per centum of the steam evaporated in the boiler, condensed in the boiler and cylinder to furnish the heat transmuted into the total horses-power developed by the engine	10. 11	9. 89	9. 14	9. 31	8. 15	7. 09	7. 27
65	Per centum of the steam evaporated in the boiler, condensed in the jacket	6. 33	5. 86	4. 69	4. 98	4. 37	3. 61	4. 46
	VAPORIZATION.							
	Absolute:							
66	Pounds of water which would have been vaporized in the boiler had the feed-water been supplied at the temperature of 100 degrees Fahrenheit and vaporized under the pressure of 14.68757 pounds per square inch, instead of the experimental temperatures and pressures	9, 591. 1699	9, 854. 1346	10, 133. 8993	10, 498. 9809	11, 507. 8594	13, 082. 7920	8, 608. 2581

* Steam used with condensation, and different measures of expansion.

TABLE NO. 1.—*Containing the data and results of the experiments made by Henry Watermann, in 1864, &c.*—Continued.

No. of line.		Steam of boiler-pressure in the jacket.*						
	Designation of the experiment	G	H	I	J	K	L	M
	Number of times the steam was expanded	3.6165	3.0793	1.9317	1.9317	1.3178	1.1068	1.1068
	VAPORIZATION—Continued.							
	Absolute—Continued.							
67	Pounds of water which would have been vaporized in the boiler had the feed-water been supplied at the temperature of 212 degrees Fahrenheit and vaporized under the pressure of 14.68757 pounds per square inch, instead of the experimental temperatures and pressures	10,712.0069	11,005.7020	11,318.1604	11,725.9059	12,852.6833	14,612.7034	9,614.2307
	Economic:							
68	Pounds of water vaporized from 100 degrees Fahrenheit by one pound of anthracite	9.4494	9.1837	9.3314	9.4756	9.3332	9.2785	9.0423
69	Pounds of water vaporized from 100 degrees Fahrenheit by one pound of combustible	11.1266	10.5731	10.8268	11.0052	10.6063	10.7943	10.5235
70	Pounds of water vaporized from 212 degrees Fahrenheit by one pound of anthracite	10.5537	10.2570	10.4219	10.5829	10.4239	10.3636	10.0990
71	Pounds of water vaporized from 212 degrees Fahrenheit by one pound of combustible	12.4269	11.8087	12.0920	12.2913	11.8458	12.0567	11.7533

* Steam used with condensation and with different measures of expansion.

Table No. 2, containing the data and results of the experiments made by Henry Watermann, in 1864, at the Clinton Foundery, No. 239 Cherry street, New York City, on the economic efficiency of steam used with and without condensation, and with different measures of expansion, for the production of power in a steam-engine, the cylinder of which was jacketed on top, bottom, and sides, with its piston and piston-rod also jacketed; the experiments being made with steam in the jacket of both the boiler-pressure and of the greater pressure furnished by an auxiliary boiler for that purpose; also, without steam in those portions of the jacket covering the piston and piston-rod and the top and bottom of the cylinder, the remaining portions being filled with steam.

Number of line.		Steam of the auxiliary boiler-pressure in the jacket.*			Steam of boiler-pressure in the jacket, excepting the parts below stated.*			
					Water of condensation not drawn from the valve-chest.	Upper head of cylinder not steam-jacketed.	Lower head of cylinder not steam-jacketed.	Piston and piston-rod not steam-jacketed.
	Designation of the experiment	N	O	P	Q	R	S	T
	Number of times the steam was expanded	3.0793	1.9317	1.3178	3.6165	1.9317	1.3178	3.6165
1	Date of commencing experiment	10 a. m. Oct. 3	10 a. m. Oct. 6	10 a. m. Oct. 10	11 a. m. June 1	11 a. m. Aug. 19	10 a. m. Aug. 5	10 a. m. June 3
2	Duration of experiment in consecutive hours	30.	30.	30.	30.	30.	30.	30.
	TOTAL QUANTITIES.							
3	Total number of double strokes made by the engine's piston	77, 696.	77, 529.	77, 380.	77, 667.	77, 636.	77, 592.	77, 624.
4	Total number of revolutions made by the fan	123, 241. 9390	122, 977. 0425	122, 740. 6977	123, 195. 9391	123, 146. 7666	123, 076. 9735	123, 127. 7322
5	Total number of cubic feet of feed-water pumped from the tank into the boiler	132. 8196	144. 2257	166. 5947	164. 6778	169. 8263	210. 9510	156. 3923
6	Total number of pounds of feed-water pumped from the tank into the boiler	8, 224. 3549	9, 084 4345	10, 326. 2290	10, 211. 9929	10, 519. 4138	13, 046. 2633	9, 867. 8883
7	Total number of pounds of the water of condensation drawn from the steam-jacket	508. 00	455. 50	513. 00	654. 50	526. 50	256. 75	532. 25
8	Total number of pounds of the water of condensation drawn from the valve-chest of the cylinder	545. 00	419. 50	388. 50	.....	467. 25	384. 65	497. 75
9	Total number of pounds of steam that entered the cylinder	7, 171. 3549	8, 209. 4345	9, 424. 7290	9, 557. 4929	9, 525. 6638	12, 404. 8633	8, 657. 8883
10	Total number of pounds of anthracite consumed	956. 50	1, 028. 00	1, 176. 50	1, 152. 00	1, 176. 00	1, 411. 00	1, 084. 00
11	Total number of pounds of refuse from the anthracite, in ash, clinker, &c	170. 00	174. 75	159. 50	146. 00	173. 00	196. 00	124. 00
12	Total number of pounds of combustible consumed	786. 50	853. 25	1, 017. 00	1, 006. 00	993. 00	1, 215. 00	960. 00
13	Per centum of the anthracite in refuse of ash, clinker, &c	17. 77	17. 00	13. 56	12. 67	14. 84	13. 89	11. 44
	QUANTITIES PER HOUR.							
14	Pounds of feed-water pumped from the tank into the boiler per hour	274. 1452	302. 8145	344. 2076	340. 3997	350. 6471	434. 8754	322. 9296
15	Pounds of steam that entered the cylinder per hour	239. 0452	273. 6478	314. 1576	318. 5831	317. 5221	413. 4954	288. 5963

* Steam used with condensation and with different measures of expansion.

Table No. 2, containing the data and results of the experiments made by Henry Watermann, in 1864, &c.—Continued.

Number of line.		Steam of the auxiliary boiler-pressure in the jacket.*			Steam of boiler-pressure in the jacket, excepting the parts below stated.*			
					Water of condensation not drawn from the valve-chest.	Upper head of cylinder not steam-jacketed.	Lower head of cylinder not steam-jacketed.	Piston and piston-rod not steam-jacketed.
	Designation of the experiment	N	O	P	Q	R	S	T
	Number of times the steam was expanded	3.0793	1.9317	1.3178	3.6165	1.9317	1.3178	3.6165
	QUANTITIES PER HOUR—Continued.							
16	Per centum of the steam evaporated in the boiler that entered the cylinder	87.20	90.37	91.27	93.59	90.53	95.08	89.37
17	Pounds of anthracite consumed per hour	31.8833	34.2667	39.2167	38.4000	39.2000	47.0333	36.1333
18	Pounds of combustible consumed per hour	26.2167	28.4417	33.9000	33.5333	33.1000	40.5000	32.0000
19	Pounds of anthracite consumed per hour per square foot of grate-surface	4.4282	4.7593	5.4468	5.3333	5.4444	6.5324	5.0185
20	Pounds of anthracite consumed per hour per square foot of heating-surface	0.1104	0.1187	0.1358	0.1330	0.1358	0.1629	0.1252
21	Pounds of combustible consumed per hour per square foot of grate-surface	3.6412	3.9502	4.7083	4.6574	4.5972	5.6250	4.4444
22	Pounds of combustible consumed per hour per square foot of heating surface	0.0908	0.0985	0.1174	0.1162	0.1147	0.1403	0.1108
	ENGINE.							
23	Number of double strokes of engine's piston made per minute	43.164	43.072	42.989	43.148	43.131	43.107	43.124
24	Number of revolutions of the fan made per minute	68.468	68.321	68.189	68.442	68.414	68.378	68.404
25	Steam-pressure in the boiler, in pounds per square inch, above the atmosphere	33.64	27.19	22.45	45.26	34.51	37.96	47.51
26	Difference between the steam-pressures in the boiler and in the cylinder at commencement of stroke of piston, in pounds per square inch	1.28	7.33	5.27	12.33	13.22	19.41	16.25
27	Fraction of the stroke of the piston completed when the steam was cut off	0.30	0.50	0.75	0.25	0.50	0.75	0.25

32	Temperature, in degrees Fahrenheit, of the steam in the auxiliary boiler	346.4	348.7	353.8	292.5	279.9	284.1	295.0
33	Temperature, in degrees Fahrenheit, of the engine-room	72.3	78.1	66.5	.....	.....	.....	.....
34	Temperature, in degrees Fahrenheit, of the feed-water in the tank	97.5	98.2	98.5	80.1	82.1	83.3	[illegible]
35	Temperature, in degrees Fahrenheit, of the hot-well	102.7	102.7	103.1	101.1	101.8	109.0	101.5
36	Temperature, in degrees Fahrenheit, of the injection-water	56.0	55.0	54.0	104.0	106.0	112.0	104.4
	STEAM-PRESSURES IN CYLINDER, PER INDICATOR.				62.0	77.0	76.0	65.0
37	In pounds per square inch above zero at commencement of stroke of piston	47.11	34.44	31.86	47.57	36.01	33.23	45.97
38	In pounds per square inch above zero at point of cutting off the steam	36.78	26.40	26.01	40.54	29.32	26.58	37.99
39	In pounds per square inch above zero at the end of the stroke of the piston	13.93	16.46	20.60	14.00	16.41	19.44	13.73
40	In pounds per square inch above zero against the piston during its stroke	2.76	3.05	3.44	3.29	2.76	3.56	3.17
41	Mean gross effective pressure upon the piston, in pounds per square inch	23.82	23.39	24.73	23.58	25.31	24.98	23.23
42	Mean total pressure upon the piston, in pounds per square inch	26.58	26.44	28.17	26.87	28.07	28.54	26.40
43	Mean net pressure upon the piston, in pounds per square inch	20.82	20.39	21.73	20.58	22.31	21.98	20.23
	POWER.							
	Absolute:							
44	Gross effective horses-power developed by the engine	9.7162	9.5205	10.0465	9.6148	10.3162	10.1759	9.4668
45	Total horses-power developed by the engine	10.8420	10.7620	11.4440	10.9563	11.4411	11.6262	10.7586
46	Net horses-power developed by the engine	8.4925	8.2994	8.4278	8.3915	9.0934	8.9539	8.2442
	Economic:							
47	Pounds of feed-water consumed per hour per gross effective horse-power	28.2152	31.8066	34.2613	35.4038	33.9899	42.7356	34.7551
48	Pounds of feed-water consumed per hour per total horse-power	25.2854	28.1375	30.0776	31.0689	30.6481	37.4049	30.0158
49	Pounds of feed-water consumed per hour per net horse-power	32.2796	36.4863	40.8420	40.5647	38.5604	48.5685	39.1704
50	Pounds of steam that entered the cylinder consumed per hour per gross effective horse-power	24.6027	28.7430	31.2703	33.1336	30.7790	40.6356	30.4323
51	Pounds of steam that entered the cylinder consumed per hour per total horse-power	22.0481	25.4365	27.4605	29.0776	27.7528	35.5658	26.8248
52	Pounds of steam that entered the cylinder consumed per hour per net horse-power	28.1478	32.9720	37.2763	37.9650	34.9179	46.1805	35.0060
53	Pounds of anthracite consumed per hour per gross effective horse-power	3.2712	3.5993	3.9035	3.9938	3.7998	4.6210	3.8168
54	Pounds of anthracite consumed per hour per total horse-power	3.0417	3.1840	3.4268	3.5048	3.4262	4.0455	3.3586
55	Pounds of anthracite consumed per hour per net horse-power	3.7543	4.1288	4.6533	4.5761	4.3108	5.2528	4.3829
56	Pounds of combustible consumed per hour per gross effective horse-power	2.6982	2.9874	3.3743	3.4877	3.2655	3.9800	3.3802
57	Pounds of combustible consumed per hour per total horse-power	2.4181	2.6428	2.9622	3.0606	2.8931	3.4835	2.9744
58	Pounds of combustible consumed per hour per net horse-power	3.0870	3.4270	4.0224	3.9961	3.6411	4.5232	3.8815

* Steam used with condensation and with different measures of expansion.

Table No. 2, containing the data and results of the experiments made by Henry Watermann, in 1864, &c.—Continued.

Number of line.		Steam of the auxiliary boiler-pressure in the jacket.*			Steam of boiler-pressure in the jacket, excepting the parts below stated.*			
					Water of condensation not drawn from the valve-chest.	Upper head of cylinder not steam-jacketed.	Lower head of cylinder not steam-jacketed.	Piston and piston-rod not steam-jacketed.
	Designation of the experiment	N	O	P	Q	R	S	T
	Number of times the steam was expanded	3.0793	1.9317	1.3178	3.6165	1.9317	1.3178	3.6165
	CONDENSATION.							
59	Total number of pounds of steam discharged from the cylinder into the condenser, calculated from the pressure of the steam at the end of the stroke of the piston	6,202.2615	7,262.4191	8,999.1718	6,229.9073	7,250.8528	8,534.4643	6,110.9590
60	Total number of pounds of steam condensed in the boiler and cylinder to furnish the heat transmuted into the total horse-power developed by the engine, according to Joule's equivalent	908.6683	895.6380	947.2068	952.2865	959.6931	978.4671	913.9782
61	Sum of the above quantities, or number of pounds of steam accounted for by the indicator	7,110.9298	8,158.0571	9,946.3786	7,182.1938	8,210.5459	9,512.9314	7,024.9372
62	Per centum of the steam evaporated in the boiler not accounted for by the indicator	13.54	10.20	3.68	29.67	21.95	27.08	27.49
63	Per centum of the steam evaporated in the boiler not accounted for by the indicator, and by the water of condensation drawn from the steam-jacket and valve-chest	0.73	0.57	0.00	.....	12.58	22.17	16.86
64	Per centum of the steam evaporated in the boiler, condensed in the boiler and cylinder to furnish the heat transmuted into the total horse-power developed by the engine	10.79	9.86	9.17	9.33	9.12	7.50	9.43
65	Per centum of the steam evaporated in the boiler, condensed in the jacket	6.18	5.01	4.97	6.41	5.00	1.97	5.49
	VAPORIZATION.							
	Absolute:							
66	Pounds of water which would have been vaporized in the boiler had the feed-water been supplied at the temperature of 100 degrees Fahrenheit and vaporized under the pressure of 14.68757 pounds per square inch, instead of the experimental temperatures and pressures	8,398.8919	9,248.0824	10,488.5142	10,433.9362	10,703.5611	13,203.2721	9,907.3596
67	Pounds of water which would have been vaporized in the boiler had the feed-water been supplied at the temperature of 212 de-							

68	Pounds of water vaporized from 100 degrees Fahrenheit by one pound of anthracite	8.7809	8.9909	8.9150	9.0659	9.1017	9.3574	9.1396
69	Pounds of water vaporized from 100 degrees Fahrenheit by one pound of combustible	10.6788	10.8387	10.3132	10.3717	10.7790	10.8669	10.3022
70	Pounds of water vaporized from 212 degrees Fahrenheit by one pound of anthracite	9.8068	10.0473	9.9568	10.1155	10.1651	10.4507	10.2075
71	Pounds of water vaporized from 212 degrees Fahrenheit by one pound of combustible	11.9265	12.1050	11.5184	11.5835	12.0324	12.1358	11.5260

* Steam used with condensation and with different measures of expansion.

Table No. 2, containing the data and results of the experiments made by Henry Watermann, in 1864, &c.—Continued.

Number of line.		Steam of boiler-pressure in the jacket. (The piston and piston-rod in experiment W were not steam-jacketed.)*				
	Designation of the experiment Number of times the steam was expanded	U 3.6165	V 3.0793	W 3.0793	X 1.6283	Y 1.3178
1	Date of commencing experiment	10 a. m. Dec. 30	Two experim'nts of 30 hours each, 10 a. m. Nov. 2, and 10 a. m. Oct. 28.	Two experim'nts of 30 hours each, 10 a. m. Dec. 16, and 11 a. m. Dec. 27.	10 a. m. Oct. 24	10 a. m. Oct. 19
2	Duration of experiment in consecutive hours	30.	60.	60.	30.	30.
	TOTAL QUANTITIES.					
3	Total number of double strokes made by the engine's piston	70,311.	145,073.	140,760.	77,347.	76,927.
4	Total number of revolutions made by the fan	111,527.8004	230,115.8081	223,274.4973	122,688.3528	122,022.1459
5	Total number of cubic feet of feed-water pumped from the tank into the boiler	186.1753	383.7568	387.6221	245.7414	255.6903
6	Total number of pounds of feed-water pumped from the tank into the boiler	11,615.0700	23,862.4624	23,559.0450	15,322.8892	15,856.8884
7	Total number of pounds of the water of condensation drawn from the steam-jacket	560.50	1,303.25	783.00	540.25	506.75
8	Total number of pounds of the water of condensation drawn from the valve-chest of the cylinder	579.50	693.25	1,151.75	333.75	281.25
9	Total number of pounds of steam that entered the cylinder	10,475.0700	21,865.9624	21,624.2950	14,448.8892	15,068.8884
10	Total number of pounds of anthracite consumed	1,407.50	3,241.00	2,571.00	2,138.00	1,890.00
11	Total number of pounds of refuse from the anthracite, in ash, clinker, &c	178.00	767.75	344.00	569.50	325.75
12	Total number of pounds of combustible consumed	1,229.50	2,473.25	2,227.00	1,568.50	1,564.25
13	Per centum of the anthracite in refuse of ash, clinker, &c	12.65	23.69	13.38	26.64	17.23
	QUANTITIES PER HOUR.					
14	Pounds of feed-water pumped from the tank into the boiler per hour	387.1690	397.7077	392.6508	510.7630	528.5629
15	Pounds of steam that entered the cylinder per hour	349.1690	364.4327	360.4049	481.6296	502.2667
16	Per centum of the steam evaporated in the boiler that entered the cylinder	95.01	91.16	91.80	94.30	95.03
17	Pounds of anthracite consumed per hour	46.9167	54.0167	42.8500	71.2667	63.0000
18	Pounds of combustible consumed per hour	40.9833	41.2208	37.1167	52.2833	52.1417
19	Pounds of anthracite consumed per hour per square foot of grate-surface	6.5162	7.5023	5.9514	9.8981	8.7500
20	Pounds of anthracite consumed per hour per square foot of heating-surface	0.1625	0.1871	0.1485	0.2469	0.2182
21	Pounds of combustible consumed per hour per square foot of grate-surface	5.6921	5.7251	5.1551	7.2616	7.2419
22	Pounds of combustible consumed per hour per square foot of heating-surface	0.1419	0.1428	0.1286	0.1811	0.1806
	ENGINE.					
23	Number of double strokes of engine's piston made per minute	39.062	40.298	39.100	42.971	42.737
24	Number of revolutions of the fan made per minute	61.960	63.921	62.021	68.160	67.780
	Steam-pressure in the boiler, in pounds per square inch, above the atmosphere	59.90	59.60	59.90	46.81	44.06
	Difference between the steam-pressures in the boiler and in the cylinder at commencement, in pounds per square inch	8.36	10.46	10.90	8.28	9.81

28	...on of the stroke of the piston completed when the steam was cut off	0.25	0.30	0.30	0.60	0.75
29	Vacuum in the condenser, in inches of mercury	.....	.....	.....	.....	.....
	Height of the barometer, in inches of mercury	29.73	29.75	29.61	29.84	29.76
30	Steam-pressure in the auxiliary boiler, in pounds per square inch, above the atmosphere	.....	.....	.....	.....	.....
	TEMPERATURE.					
31	Temperature, in degrees Fahrenheit, of the steam in the boiler	307.0	306.7	306.9	294.1	291.1
32	Temperature, in degrees Fahrenheit, of the steam in the auxiliary boiler	.....	.....	.....	.....	.....
33	Temperature, in degrees Fahrenheit, of the engine-room	61.5	69.1	62.8	70.3	69.6
34	Temperature, in degrees Fahrenheit, of the feed-water in the tank	37.7	53.3	39.2	55.3	56.0
35	Temperature, in degrees Fahrenheit, of the hot-well	.....	.....	.....	.....	.....
36	Temperature, in degrees Fahrenheit, of the injection-water	.....	.....	.....	.....	.....
	STEAM-PRESSURES IN CYLINDER, PER INDICATOR.					
37	In pounds per square inch above zero at commencement of stroke of piston	66.14	63.74	63.53	53.18	48.86
38	In pounds per square inch above zero at point of cutting off the steam	57.00	53.26	53.41	42.50	39.25
39	In pounds per square inch above zero at the end of the stroke of the piston	20.76	20 70	20.02	28.41	30.46
40	In pounds per square inch above zero against the piston during its stroke	14.60	14.60	14.53	14.65	14.61
41	Mean gross effective pressure upon the piston, in pounds per square inch	22.70	23.83	22.60	28.04	26.85
42	Mean total pressure upon the piston, in pounds per square inch	37.30	38.43	37.13	42.69	41.46
43	Mean net pressure upon the piston, in pounds per square inch	19.70	20.83	19.60	25.04	23.85
	POWER.					
	Absolute:					
44	Gross effective horse-power developed by the engine	8.3794	9.0749	8.3506	11.3864	10.8438
45	Total horse-power developed by the engine	14.7689	14.6349	13.7194	17.3355	16.7443
46	Net horse-power developed dy the engine	7.2720	7.9325	7.2422	10.1682	9.6321
	Economic:					
47	Pounds of feed-water consumed per hour per gross effective horse-power	46.2046	43.8250	47.0207	44.8573	48.7431
48	Pounds of feed-water consumed per hour per total horse-power	26.2152	27.1753	28.6201	29.4639	31.5666
49	Pounds of feed-water consumed per hour per net horse-power	53.2108	50.1365	54.2171	50.2313	54.8749
50	Pounds of steam that entered the cylinder consumed per hour per gross effective horse-power	41.6699	40 1583	43.1592	42.2987	46.3183
51	Pounds of steam that entered the cylinder consumed per hour per total horse-power	23.6422	24.9016	26.2697	27.7823	29.9963
52	Pounds of steam that entered the cylinder consumed per hour per net horse-power	48.0156	45.9417	49.7646	47.3663	52.1451
53	Pounds of anthracite consumed per hour per gross effective horse-power	5.5990	5.9523	5.1314	6.2589	5.8097
54	Pounds of anthracite consumed per hour per total horse-power	3.1090	3.6910	3.1233	4.1110	3.7625
55	Pounds of anthracite consumed per hour per net horse-power	6.4517	6.8095	5.9167	7.0088	6.5406
56	Pounds of combustible consumed per hour per gross effective horse-power	4.8910	4.5423	4.4448	4.5917	4.8084
57	Pounds of combustible consumed per hour per total horse-power	2.0979	2.8166	2.7054	3.0159	3.1140
58	Pounds of combustible consumed per hour per net horse-power	5.6358	5.1964	5.1251	5.1418	5.4133
	CONDENSATION.					
59	Total number of pounds of steam discharged from the cylinder into the condenser, calculated from the pressure of the steam at the end of the stroke of the piston	8,238.1616	16,950.5575	15,926.7324	12,249.0236	13,024.0065
60	Total number of pounds of steam condensed in the boiler and cylinder to furnish the heat transmuted into the total horse-power developed by the engine, according to Joule's equivalent	1,265.6469	2,507.7701	2,351.3139	1,470.5449	1,416.3589

* Steam used without condensation and with different measures of expansion.

Table No. 2, containing the data and results of the experiments made by Henry Watermann, in 1864, &c.—Continued.

Number of line.		Steam of boiler-pressure in the jacket. (The piston and piston-rod in experiment W were not steam-jacketed.)*				
	Designation of the experiment	U	V	W	X	Y
	Number of times the steam was expanded	3.6165	3.0793	3.0793	1.6283	1.3178
	CONDENSATION—Continued.					
61	Sum of the above two quantities, or number of pounds of steam accounted for by the indicator	9,503.8085	19,458.3276	18,278.0463	13,719.5685	14,440.9654
62	Per centum of the steam evaporated in the boiler not accounted for by the indicator	18.18	18.46	22.42	10.46	8.93
63	Per centum of the steam evaporated in the boiler not accounted for by the indicator and by the water of condensation drawn from the steam-jacket and valve-chest	8.36	10.09	14.20	4.76	3.96
64	Per centum of the steam evaporated in the boiler, condensed in the boiler and cylinder to furnish the heat transmuted into the total horse-power developed by the engine	10.90	10.51	9.98	9.60	8.94
65	Per centum of the steam evaporated in the boiler condensed in the jacket	4.83	5.46	3.32	3.53	3.20
	VAPORIZATION.					
	Absolute:					
66	Pounds of water which would have been vaporized in the boiler, had the feed-water been supplied at the temperature of 100 degrees Fahrenheit and vaporized under the pressure of 14.68757 pounds per square inch, instead of the experimental temperatures and pressures	12,599.1534	25,536.5602	25,521.7514	16,314.8258	16,859.4732
67	Pounds of water which would have been vaporized in the boiler, had the feed-water been supplied at the temperature of 212 degrees Fahrenheit and vaporized under the pressure of 14.68757 pounds per square inch, instead of the experimental temperatures and pressures	14,071.2478	28,520.2707	28,503.7316	18,221.0621	18,829.3464
	Economic:					
68	Pounds of water vaporized from 100 degrees Fahrenheit by one pound of anthracite	8.9514	7.8792	9.9268	7.6309	8.9204
69	Pounds of water vaporized from 100 degrees Fahrenheit by one pound of combustible	10.2474	10.3251	11.4601	10.4015	10.7780
70	Pounds of water vaporized from 212 degrees Fahrenheit by one pound of anthracite	9.9973	8.7998	11.0866	8.5225	9.9626
71	Pounds of water vaporized from 212 degrees Fahrenheit by one pound of combustible	11.4446	11.5315	12.7992	11.6169	12.0373

* Steam used without condensation and with different measures of expansion.

DISCUSSION OF THE RESULTS.

Of the effect on the economic development of the power produced by admitting to or excluding from the cylinder the water of condensation in the valve-chest caused by its external radiation of heat.—Assuming the water drawn from the valve-chest (line 8) to be entirely water of condensation, produced by the difference of the temperatures of the steam inside the chest (line 31) and of the air outside the chest, (line 33,) the mean of all the experiments gives for the result of that condensation 2.1 pounds of water per thirty hours for each degree Fahrenheit difference of temperature, or 0.07 pound per hour per degree of such difference. In the case of experiments A, B, C, and D, Table No. 1, this water was passed through the cylinder, while in the remaining experiments it was withdrawn from the valve-chest, so as to prevent such passage. But it enters into the economic result in a still higher degree than its direct value, as so much steam lost; for, once in the cylinder, it acts most prejudicially, by its revaporization at the expense of the heat of the metal of the cylinder, which heat, thus lost, has to be re-obtained at the expense of the steam entering from the boiler.

The results of experiments Q, Table No. 2, and G, Table No. 1, show the effect produced on the economic efficiency by the admission to the cylinder of the water of condensation from the valve-chest, as this water was admitted in experiment Q, and not admitted in experiment G, in both of which all the remaining conditions, such as pressure, measure of expansion, steam-jacketing, speed of piston, power developed, &c., were substantially the same. Taking for the measure of the economic results the cost of the total horse-power in pounds of steam admitted to the cylinder, and deducting from the quantity admitted in experiment Q the weight of the water of condensation in the valve-chest, calculated according to the above data, (14.868 pounds per hour,) there remain, for the cost of the total horse-power in experiment Q, 27.7206 pounds of the steam entering the cylinder per hour against 24.8437 pounds per hour per total horse-power in experiment G, showing that the admission to the cylinder of the water of condensation from the valve-chest increased the cost of the total horse-power, when it was excluded, $\left(\frac{(27.7206-24.8437)\,100}{24.8437}\right)$ 11.58 per centum, or its exclusion increased the economic efficiency $\left(\frac{27.7206-24.8437\times 100}{27.7206}=\right)$ 10.38 per centum.

Of the effect on the economic development of the power produced by steam-jacketing the cylinder with steam from the boiler supplying the cylinder.—The results of experiments A, B, C, and D, Table No. 1, and of experiments from G to L, both inclusive, of the same table, show the effect produced on the economic efficiency by steam-jacketing the entire interior surfaces of the cylinder, including those of the piston and piston-rod, with steam from the boiler supplying the cylinder, as this steam was excluded from the jackets in experiments A, B, C, and D, and admitted to them in experiments G to L, while all the remaining conditions, such as pressure, measure of expansion, speed of piston, power developed, &c., were substantially the same in both series of experiments, except that in the first the water of condensation from the valve-chest was passed through the cylinder, and in the second it was drawn off from the valve-chest, and did not enter the cylinder, whereby the cost of the total horse-power in pounds of steam entering the cylinder per hour (line 51) in experiments A, B, C, and D, was too great for proper comparison with this cost in experiments G to L, both by the amount of such water of condensation and by 10.38 per centum of the quantity remaining after its deduction, as just shown in the immediately preceding paragraph; the results, therefore, in experiments A, B, C, and D require correction by the deduction of both these quantities, after which the remainder will be strictly comparable with the results of experiments G to L for the purpose proposed.

The water of condensation per hour in experiments A, B, C, and D, calculated as above described, is as follows: for experiment A, 15.071 pounds; for experiment B, 14.406 pounds; for experiment C, 13.230 pounds; and for experiment D, 13.167 pounds. These quantities being deducted from those on line 14, and 10.38 per centum being deducted from the remainder, leave respectively 373.2813, 419.1479, 432.3830, and 481.0801 pounds of steam entering the cylinder per hour, which, being divided by the total horses-power developed by the engine, (line 45,) gives for the cost of the total horse-power in pounds of steam entering the cylinder per hour, respectively, 33.4766, 35.6367, 37.8245, and 41.4114.

Comparing the results of experiments A and G, in both of which the steam was cut off at 0.25 of the stroke of the piston from the commencement, and expanded 3.6165 times, and in the latter of which the pressure of the steam in the jackets was 13.98 pounds per square inch above the initial cylinder-pressure, the cost of the total horse-power in pounds of steam entering the cylinder per hour was $\left(\frac{33.4766-24.8437\times 100}{33.4766}=\right)$ 25.79 per centum less when the steam was used in the jackets.

Comparing the results of experiment B with the mean of those from experiments I and J $\left(\frac{27.6941+27.0359}{2}=27.3650\right)$, in all of which the steam was cut off at 0.50 of the stroke of the piston and expanded 1.9317 times, and in both of which latter the mean pressure of the steam in the jackets was $\left(\frac{14.39+13.46}{2}=\right)$ 13.92 pounds per square inch above the initial cylinder-pressure, the cost of the total horse-power in pounds of steam entering the cylinder per hour was $\left(\frac{35.6367-27.3650\times100}{35.6367}=\right)$ 23.21 per centum less when steam was used in the jacket.

In experiment C, made without steam in the jackets, the steam in the cylinder was cut off when the piston had completed two-thirds of its stroke, and was expanded 1.4739 times. There is no experiment with steam in the jackets made with exactly this measure of expansion, but experiments I and J were made with the steam cut off at half-stroke and expanded 1.9317 times, and experiment K was made with the steam cut off at three-fourths of the stroke of the piston from the commencement and expanded 1.3178 times. If the cost of a total horse-power in weight of steam entering the cylinder per hour when using steam in the jackets and cutting off the steam in the cylinder at two-thirds of the stroke of the piston, expanding it 1.4739 times, be obtained by interpolation between the cost when cutting off the steam at half-stroke, expanding it 1.9317 times, and the cost when cutting off the steam at three-fourths of the stroke, expanding it 1.3178 times, we shall have 30.5318 pounds; and the cost of the total horse-power in pounds of steam entering the cylinder per hour will be $\left(\frac{37.8245-30.5318\times100}{37.8245}=\right)$ 19.28 per centum less when steam was used in the jackets.

Comparing the results of experiments D and L, in both of which the steam was cut off at 0.90 of the stroke of the piston from the commencement and expanded 1.1068 times, and in the latter of which the pressure of the steam in the jackets was 10.64 pounds per square inch above the initial cylinder-pressure, the cost of the total horse-power in pounds of steam entering the cylinder per hour was $\left(\frac{41.4114-36.2501\times100}{41.4114}=\right)$ 12.46 per centum less when the steam was used in the jackets.

From these comparisons it is plain that the economic efficiency of the steam-jackets increases with the measure of expansion, other things being equal, as the gain by their use when the steam is expanded 3.6165 times is 25.79 per centum; when expanded 1.9317 times, 23.21 per centum; when expanded 1.4739 times, 19.28 per centum; and when expanded 1.1068 times, 12.46 per centum. It is necessary to here recall the fact that these gains are for the cost of the total horse-power *in pounds of steam entering the cylinder per hour, after deduction of the water of condensation in the jackets and in the valve-chest.* But if the comparison be made in the respective cases for the cost of the total horse-power *in pounds of feed-water pumped into the boiler per hour,* (line 48,) a different result will be obtained, as follows:

Experiments A and G show the cost of the total horse-power in pounds of feed-water pumped into the boiler per hour to be $\left(\frac{38.7056-28.0250\times100}{38.7056}=\right)$ 27.60 per centum less when the steam was used in the jackets.

Experiment B and the mean of experiments I and J show the cost of the total horse-power in pounds of feed-water pumped into the boiler per hour to be $\left(\frac{40.9890-30.3358\times100}{40.9890}=\right)$ 25.99 per centum less when the steam was used in the jackets.

Experiment C and the results of a comparable interpolation between experiment K and the mean of experiments I and J show the cost of the total horse-power in pounds of feed-water pumped into the boiler per hour to be $\left(\frac{43.3635-33.2666\times100}{43.3635}=\right)$ 23.28 per centum less when the steam was used in the jackets.

Experiments D and L show the cost of the total horse-power in pounds of feed-water pumped into the boiler per hour to be $\left(\frac{47.3411-38.9917\times100}{47.3411}=\right)$ 17.64 per centum less when the steam was used in the jackets.

These comparisons, like the previous ones, show that the economic efficiency of the steam jackets increases with the measure of expansion with which the steam is used in the cylinder; the shorter the point of cut-off, other things equal, the greater the gain obtained from the use of steam-jackets.

In commercial practice, the water of condensation is not drawn off from the valve-chest in either the jacketed or the unjacketed engine, but passes into the cylinder with the steam, producing an injurious effect upon the economy; hence, the last four determinations give too high a per centum of gain for the use of the steam-jacket, because, in those cases, the water of condensation was drawn from the valve-chest when steam was used in the jackets and was not drawn from it when steam was not used in them, thus avoiding the loss due to the presence of this water of condensation in the cylinder when the steam-jackets were used, and incurring it when the steam-jackets were not used.

The first four determinations, made for equality as regards the effect in the cylinder of the water of condensation from the valve-chest, by excluding it from the cylinder in both the cases of using and of not using the steam-jackets, and of not including the water of condensation from the steam-jackets in the cost of the power when using the steam-jackets, show the gain due to the steam-jacket under the most favorable conditions for the latter, namely, a thickness of only one-tenth of an inch of steel for the transmission of the heat from the jacket to the cylinder surfaces, a complete jacketing of the entire interior surfaces of the cylinder, including those of the piston and the piston-rod, and a steam-pressure in the jackets averaging 13.94 pounds per square inch more than the initial steam-pressure in the cylinder.

There still remains the determination of the economic efficiency of the steam-jacket under the conditions of commercial practice, the water of condensation in the valve-chest being passed through the cylinder in both cases of steam-jacketing and not steam-jacketing, and including in the cost of the power in the former case the water of condensation from the steam-jackets.

It has been shown that the passage of the water of condensation from the valve-chest through the cylinder increased the cost of the total horse-power in pounds of water per hour 11.58 per centum when the cylinder was steam-jacketed. Applying this correction to the quantities on line 48 for experiments G to L, both inclusive, we obtain the following pounds of water for the cost per hour of the total horse-power in those experiments, namely: 31.2703 pounds in experiment G, 31.8146 pounds in experiment H, 34.1275 pounds in experiment I, 33.5698 pounds in experiment J, 38.2340 pounds in experiment K, and 43.5069 pounds in experiment L. These quantities are comparable with those on line 48 for experiments A, B, C, and D.

Comparing the results of experiments A and G, the cost of the total horse-power in pounds of feed-water pumped into the boiler per hour is $\left(\frac{38.7056 - 31.2703 \times 100}{38.7056} = \right)$ 19.21 per centum less when the steam was used in the jackets.

Comparing the results of experiment B with the mean of those from experiments I and J, $\left(\frac{34.1275 + 33.5698}{2} = 33.8486 \text{ pounds,}\right)$ the cost of the total horse-power in pounds of feed-water pumped into the boiler per hour is $\left(\frac{40.9890 - 33.8486 \times 100}{40.9890} = \right)$ 17.42 per centum less when the steam was used in the jackets.

Comparing the results of experiment C with those of a comparable interpolation between the results of experiment K and the mean of the results of experiments I and J he cost of the total horse-power in pounds of feed-water pumped into the boiler per, hour is $\left(\frac{43.3635 - 37.1189 \times 100}{43.3635} = \right)$ 14.40 per centum less when the steam was used in the jackets.

Comparing the results of experiments D and L, the cost of the total horse-power in pounds of feed-water pumped into the boiler per hour is $\left(\frac{47.3411 - 43.5069 \times 100}{47.3411} = \right)$ 8.1 per centum less when the steam is used in the jackets.

In this comparison, as in the others, the efficiency of the steam-jacket increases as the measure of expansion with which the steam is used increases. For the measure of expansion 3.6165, the gain by the steam-jacket was 19.21 per centum of the cost of the power without the steam-jacket. For the measure of expansion 1.9317, the gain was 17.42 per centum. For the measure of expansion 1.4739, the gain was 14.40 per centum, and for the measure of expansion 1.1068, the gain was 8.10 per centum. These are the true commercial gains, supposing equal powers to be developed in the same cylinder in equal times, with equal speed of piston, equal mean pressure upon it, and equal back-pressure against it, but with different measures of expansion and different initial pressures, the latter being higher as the measure of expansion is greater.

Of the effect on the economic development produced by steam-jacketing the cylinder with steam from an auxiliary boiler supplying the jackets with steam of a much higher pressure

than was supplied by the main boiler to the cylinder.—In the foregoing experiments with steam-jacketing, the same boiler supplied steam to both the cylinder and the jackets, and with so marked an economic advantage that the suggestion arose whether this advantage would not become still greater, and to what extent, if the jackets were supplied with steam of a very much higher pressure than was supplied to the cylinder, an auxiliary boiler being employed to obtain this high pressure for the jackets. For this purpose, experiments N, O, and P, Table No. 2, were made strictly comparable with experiment H, the mean of experiments I and J, and with experiment K, Table No. 1, respectively. In all these experiments, the power developed, speed of piston, mean pressure on the piston and against it, &c., were substantially the same; the measure of expansion with which the steam was used was also the same for each comparable pair of experiments, but differed for the different pairs, in order that the effect of this difference might be ascertained. The only variable condition, that of the pressure in the steam-jackets, was the one whose effect was to be tested. In all these experiments the water of condensation in the valve-chest and in the steam-jackets was drawn off and weighed separately, so that the comparison can be made for the steam which entered the cylinder as well as for the steam which was generated in the boiler. In making these comparisons for the first case, the quantities on line 51 will be used, those being the pounds of steam that entered the cylinder per hour per total horse-power; and, for the second case, the quantities on line 48 will be used, these being the pounds of feed-water pumped into the boiler per hour per total horse-power developed by the engine.

Comparing, in the first case, the results of experiments H and N, in both of which the steam was expanded 3.0793 times, but in the first of which the pressure in the jackets was only 14.49 pounds per square inch above the initial cylinder-pressure, while in the second it was 81.84 pounds, the cost of the total horse-power in pounds of steam that entered the cylinder per hour was $\left(\frac{25.5125 - 22.0481 \times 100}{25.5125} = \right)$ 13.58 per centum less with the higher pressure in the jackets.

Comparing the results of the mean of experiments I and J with the results of experiment O, in all of which the steam was expanded 1.9317 times, but in the first two of which the pressure in the jackets was only 13.92 pounds per square inch above the initial cylinder-pressure, while in the last it was 98.04 pounds, the cost of the total horse-power in pounds of steam that entered the cylinder per hour was $\left(\frac{27.3650 - 25.4365 \times 100}{27.3650} = \right)$ 7.03 per centum less with the higher pressure in the jackets.

Comparing the results of experiments K and P, in both of which the steam was expanded 1.3178 times, but in the first of which the pressure in the jackets was only 16.67 pounds per square inch above the initial cylinder-pressure, while in the last it was 109.82 pounds, the cost of the total horse-power in pounds of steam that entered the cylinder per hour was $\left(\frac{31.6116 - 27.4605 \times 100}{31.6116} = \right)$ 13.13 per centum less with the higher pressure in the cylinder.

In the above three comparisons, the steam-pressures respectively carried in the auxiliary boiler were 114.00, 117.90, and 127.00 pounds per square inch above the atmosphere, and the result was a very marked increase in the efficiency of the jackets, averaging a gain of 11.25 per centum of the cost of the total horse-power when the jackets were filled with steam from the main boiler, having respectively the pressures of 44.03, 34.54, and 33.45 pounds per square inch above the atmosphere. The above average gain of 11.25 per centum was due to an average increased pressure of 82.29 pounds per square inch, giving an increased temperature of 66 2°.

Taking now, in the second case, the cost of the total horse-power in pounds of feed-water pumped into the boiler per hour as the measure of the economic efficiency with the steam-jackets supplied with steam from the main boiler and from the auxiliary boiler, the following are the gains due to the higher steam-pressure supplied to the jackets by the latter.

Comparing the results of experiments H and N, in both of which the steam was expanded 3.0793 times, but in the first of which the pressure in the jackets was only 14.49 pounds per square inch above the initial cylinder-pressure, while in the second it was 81.84 pounds, the cost of the total horse-power in pounds of feed-water pumped into the boiler was $\left(\frac{28.5128 - 25.2854 \times 100}{28.5128} = \right)$ 11.32 per centum less with the higher pressure in the jackets.

Comparing the results of the mean of experiments I and J with the results of experiment O, in all of which the steam was expanded 1.9317 times, but in the first two of which the pressure in the jackets was only 13.92 pounds per square inch above the initial

cylinder-pressure, while in the last it was 98.04 pounds, the cost of the total horse-power in pounds of feed-water pumped into the boiler was $\left(\frac{30.3358 - 28.1375 \times 100}{30.3358} =\right) 7.25$ per centum less with the higher pressure in the jackets.

Comparing the results of experiments K and P, in both of which the steam was expanded 1.3178 times, but in the first of which the pressure in the jackets was only 16.67 pounds per square inch above the initial cylinder-pressure, while in the last it was 109.82 pounds, the cost of the total horse-power in pounds of feed-water pumped into the boiler was $\left(\frac{34.2660 - 30.0776 \times 100}{34.2660} =\right) 12.22$ per centum less with the higher pressure in the jackets.

The average gain in the above three comparisons is 10.26 per centum of the cost of the total horse-power when the jackets were filled with steam from the main boiler, having, respectively, the pressures of 44.03, 34.54, and 33.45 pounds per square inch above the atmosphere. The pressure in the auxiliary boiler being, respectively, 114.00, 117.90, and 127.00 pounds per square inch above the atmosphere, the gain of 10.26 per centum was due to an average increase of 82.29 pounds per square inch, which gave an increased temperature of 66.2° F. Under these conditions there was, as an average, neither condensation nor superheating of the steam in the cylinder, the whole of the feed-water pumped into the boiler being just about accounted for by the indicator and by the quantities of water drawn from the valve-chest and steam-jackets. Hence, it appears that a steam-pressure in the jackets averaging 96½ pounds per square inch above the initial cylinder-pressure, and which gave a temperature of 85.85° F. above the temperature of the steam of initial cylinder-pressure, was just sufficient to prevent condensation in the cylinder and to cause an economy of 23½ per centum of the weight of feed-water required when the steam-jackets were not used, the average point of cutting off the steam being a little beyond half-stroke of the piston from the commencement.

Of the effect on the economic development of the power produced by omitting the steam from certain of the jackets and retaining it in others; or, in other words, by partially steam-jacketing the interior surfaces of the cylinder.—In order to test the relative value of the steam-jackets on different portions of the interior surface of the cylinder, experiments R, S, and T were made, in the first of which the steam was omitted from only the jacket of the upper head of the cylinder, the remaining jackets being filled with steam of the boiler-pressure; in the next of which the steam was omitted from only the jacket of the lower head of the cylinder, the remaining jackets being filled with steam of the boiler-pressure; and in the last of which the steam was omitted from only the jacket of the piston and piston-rod, the remaining jackets being filled with steam of the boiler-pressure. It is unfortunate that these three experiments were made using the steam with three different measures of expansion, instead of using it with the same measure of expansion, thereby preventing them from being strictly comparable, because the economy of the steam-jacket, other things equal, has been shown to vary with the measure of expansion, being less with less measures. However, an approximate comparison can be made by comparing the experiments when all the steam-jackets were employed and the steam was used with the same measures of expansion, as in experiments R, S, and T, respectively. The comparisons will be made for two determinations of the cost of the power, the first being the number of pounds of steam that entered the cylinder per hour per total horse-power, (line 51,) and the last being the number of pounds of feed-water pumped into the boiler per hour per total horse-power, (line 48.) The last, of course, gives the proper commercial economic values.

In the first case, comparing experiment R, Table No. 2, and the mean of experiments I and J, Table No. 1, in which the steam was 1.9317 times, and all the conditions were nearly the same, except that in experiment R the upper head of the cylinder was not steam-jacketed, while in experiments I and J the entire cylinder was steam-jacketed, we find that the mean of experiments I and J gives the total horse-power for 27.3650 pounds of steam entering the cylinder per hour, and that experiment R gives this power for 27.7528 pounds of steam entering the cylinder per hour; consequently, the omission of steam of boiler-pressure from the jacket of the upper head of the cylinder lessened the economic efficiency $\left(\frac{27.7528 - 27.3650 \times 100}{27.3650} =\right) 1.42$ per centum.

Again, comparing experiment S, Table No. 2, and experiment K, Table No. 1, in which the steam was expanded 1.3178 times, and all the conditions were nearly the same except that in experiment S the lower head of the cylinder was not steam-jacketed, while in experiment K the entire steam-cylinder was steam-jacketed, we find that experiment K gives the total horse-power for 31.6116 pounds of steam entering the

cylinder per hour, and that experiment S gives this power for 35.5658 pounds of steam entering the cylinder per hour; consequently, the omission of steam of boiler-pressure from the jacket of the lower head of the cylinder lessened the economic efficiency $\left(\frac{35.5658-31.6116\times100}{31.6116}=\right)$ 12.51 per centum.

Finally, comparing experiment T, Table No. 2, and experiment G, Table No. 1, in which the steam was expanded 3.6165 times, and all the conditions were nearly the same except that in experiment T the piston and piston-rod were not steam-jacketed, while in experiment G the entire cylinder was steam-jacketed, we find that experiment G gives the total horse-power for 24.8437 pounds of steam entering the cylinder per hour, and that experiment T gives this power for 26.8248 pounds of steam entering the cylinder per hour; consequently, the omission of steam of the boiler-pressure from the jacket of the piston and piston-rod of the cylinder lessened the economic efficiency $\left(\frac{26.8248-\quad 00}{24.8437}=\right)$ 7.97 per centum.

In the second case, comparing experiment R, Table No. 2, and the mean of experiments I and J, Table No. 1, in which the steam was expanded 1.9317 times, and all the conditions were nearly the same except that in experiment R the upper head of the cylinder was not steam-jacketed, while in experiments I and J the entire cylinder was steam-jacketed, we find that the mean of experiments I and J gives the total horse-power for 30.3358 pounds of feed-water pumped into the boiler per hour, and that experiment R gives this power for 30.6481 pounds of feed-water pumped into the boiler per hour; consequently, the omission of steam of boiler-pressure from the jacket of the upper head of the cylinder lessened the economic efficiency $\left(\frac{30.6481-30.3358\times100}{30.3358}=\right)$ 1.03 per centum.

Again, comparing experiment S, Table No. 2, and experiment K, Table No. 1, in which the steam was expanded 1.3178 times, and all the conditions were nearly the same except that in experiment S the lower head of the cylinder was not steam-jacketed, while in experiment K the entire cylinder was steam-jacketed, we find that experiment K gives the total horse-power for 34.2660 pounds of feed-water pumped into the boiler per hour, and that experiment S gives this power for 37.4049 pounds of feed-water pumped into the boiler per hour; consequently, the omission of steam of boiler-pressure from the jacket of the lower head of the cylinder lessened the economic efficiency $\left(\frac{37.4049-34.2660\times100}{34.2660}=\right)$ 9.16 per centum.

Finally, comparing experiment T, Table No. 2, and experiment G, Table No. 1, in which the steam was expanded 3.6165 times, and all the conditions were nearly the same except that in experiment T the piston and piston-rod were not steam-jacketed, while in experiment G the entire cylinder was steam-jacketed, we find that experiment G gives the total horse-power for 28.0250 pounds of feed-water pumped into the boiler per hour, and that experiment T gives this power for 30.0158 pounds of feed-water pumped into the boiler per hour; consequently, the omission of steam of boiler-pressure from the jacket of the piston and piston-rod of the cylinder lessened the economic efficiency $\left(\frac{30.0158-28.0250\times100}{28.0250}=\right)$ 7.10 per centum.

Now, for the measures of expansion just referred to, when the cylinder was not steam-jacketed, but when the experiments were otherwise alike in conditions, an allowance being made for the effect of the water of condensation not being drawn off from the valve-chest, we have for the average cost of the total horse-power 37.4637 pounds of feed-water pumped into the boiler per hour; hence, the steam-jacket on the vertical sides of the cylinder alone lessened the cost of the total horse-power in pounds of feed-water pumped into the boiler per hour $\left(\frac{37.4637-36.2140\times100}{36.2140}=\right)$ 3.45 per centum.

The effect produced by the omission of steam from the jacket of the piston and piston-rod, the remaining jackets being supplied with steam of the boiler-pressure, is further shown by a comparison of the economic efficiency given by experiments V and W, Table No. 2, in both of which the steam was expanded 3.0793 times, with the other conditions nearly the same, except that in experiment W there was no steam in the jacket of the piston and piston-rod, the remaining jackets, however, being filled with steam of the boiler-pressure, while in experiment V the entire interior surfaces of the cylinder were steam-jacketed.

In experiment V the total horse-power was obtained for 24.9016 pounds of steam

entering the cylinder per hour, while in experiment W it was obtained for 26.2697 pounds; consequently, the omission of steam from the jacket of the piston and piston-rod lessened the economy $\left(\frac{26.2697 - 24.9016 \times 100}{24.9016} =\right)$ 5.50 per centum.

In experiment V the total horse-power was obtained for 27.1753 pounds of feed-water pumped into the boiler per hour, while in experiment W it was obtained for 28.6201 pounds; consequently, the omission of steam from the jacket of the piston and piston-rod lessened the economy $\left(\frac{28.6201 - 27.1753 \times 100}{27.1753} =\right)$ 5.32 per centum.

These experiments show that every decrease in the area of the steam-jackets causes an increase in the cost of the power. They also show that the steam-jackets on the lower head of the vertical cylinder and on the upper side of the piston are the most efficient, probably because the chief portion of the water of condensation naturally rests upon them; but the main value of the experiments consists in showing how greatly the economy is increased by the steam-jacketing of the piston.

The sum of the losses by the aggregate omission of the three steam-jackets specified, was 21.90 per centum of the cost of the total horse-power in pounds of steam entering the cylinder per hour, with complete steam-jacketing. The average cost of the total horse-power with the three measures of expansion used and with complete steam-jacketing was 27.9401 pounds of steam entering the cylinder per hour, which being increased 21.90 per centum becomes 34.0590 pounds. This would have been the average cost of the total horse-power for the three measures of expansion used, had the steam-jackets on the upper and lower heads of the cylinder and on the piston and piston-rod been omitted and only the steam-jacket on the vertical sides of the cylinder retained.

Now, for the measures of expansion just referred to, when the cylinder was not steam-jacketed, but when the experiments were otherwise alike in conditions, an allowance being made for the effect of the water of condensation not being drawn off from the valve-chest, we have for the average cost of the total horse-power 36.2244 pounds of steam entering the cylinder per hour. Hence, the steam-jacket on the vertical sides of the cylinder alone lessened the cost of the total horse-power in pounds of steam entering the cylinder per hour $\left(\frac{36.2244 - 34.0590 \times 100}{34.0590} =\right)$ 6.36 per centum.

Again, the sum of the losses by the aggregate omission of the three steam-jackets specified was 17.29 per centum of the cost of the total horse-power in pounds of feed-water pumped into the boiler per hour, with complete steam-jacketing. The average cost of the total horse-power with the three measures of expansion used with complete steam-jacketing was 30.8756 pounds of feed-water pumped into the boiler per hour, which being increased 17.29 per centum becomes 36.2140 pounds. This would have been the average cost of the total horse-power for the three measures of expansion used, had the steam-jackets on the upper and lower heads of the cylinder and on the piston and piston-rod been omitted and only the steam-jacket on the vertical sides of the cylinder retained.

Of the effect on the economic development of the power produced by using the steam without condensation.—The value of experiments U to Y, Table No. 2, both inclusive, consists in their determination for the different measures of expansion with which the steam was used, of the cost of the total horse-power in pounds of steam entering the cylinder, and in pounds of feed-water entering the boiler per hour, when the steam was used without condensation, so that by a comparison of this cost with the cost of the same power under substantially the same conditions, excepting that of using the steam with condensation, a determination may be made of the effect produced on the economic development of the power in function of using the steam with or without condensation.

Making the comparisons for the first case, namely, by the pounds of steam entering the cylinder per hour per total horse-power, we have as comparable experiments, G, Table No. 1, and U, Table No. 2, in both of which the steam was expanded 3.6165 times, and in the first of which, the steam being used with condensation, the total horse-power cost 24.8437 pounds of steam entering the cylinder per hour, while in the last of which, the steam being used without condensation, the total horse-power cost 23.6422 pounds of steam entering the cylinder per hour. Hence the use of the steam without condensation increased its economy $\left(\frac{24.8437 - 23.6422 \times 100}{24.8437} =\right)$ 4.84 per centum.

Comparing experiments H, Table No. 1, and V, Table No. 2, in both of which the steam was expanded 3.0793 times, and in the first of which, the steam being used with condensation, the total horse-power cost 25.5125 pounds of steam entering the cylinder per hour, while in the last of which, the steam being used without condensation,

the total horse-power cost 24.9016 pounds of steam entering the cylinder per hour; hence, the use of the steam without condensation increased its economy $\left(\frac{25.5125 - 24.9016 \times 100}{25.5125} = \right)$ 2.39 per centum.

For comparison with the result of experiment X, Table No. 2, (there being no comparable experiment with the steam used with condensation and the same measure of expansion,) there must be interpolated a result between that of experiment K and that of the mean of experiments I and J, Table No. 1, which would have been obtained by expanding the steam 1.6283 times, the same as in experiment X. The result gives for the cost of the total horse-power 29.0636 pounds of steam entering the cylinder per hour when the steam was used with condensation, while in experiment X, using the steam without condensation, this cost was 27.7833 pounds. Hence, the use of the steam without condensation increased its economy $\left(\frac{29.0636 - 27.7833 \times 100}{29.0636} = \right)$ 4.40 per centum.

Finally, comparing experiments K, Table No. 1, and Y, Table No. 2, in both of which the steam was expanded 1.3178 times, and in the first of which, the steam being used with condensation, the total horse-power cost 31.6116 pounds of steam entering the cylinder per hour, while in the last of which, the steam being used without condensation, the total horse-power cost 29.9963 pounds of steam entering the cylinder per hour; hence, the use of the steam without condensation increased its economy $\left(\frac{31.6116 - 29.9963 \times 100}{31.6116} = \right)$ 5.11 per centum.

The percentum of gain due to the use of the steam without condensation does not appear to be affected by the measure of expansion, and the mean of all the determinations is 4.18 per centum. That is to say, the cost of the total horse-power in pounds of steam entering the cylinder per hour when the steam is used without condensation is 4.18 per centum less than when the steam is used with condensation, other things being equal.

Making the comparison for the second case, namely, by the pounds of feed-water pumped into the tank per total horse-power per hour, we have as comparable experiments, G, Table No. 1, and U, Table No. 2, in both of which the steam was expanded 3.6165 times, and in the first of which, the steam being used with condensation, the total horse-power cost 28.0250 pounds of feed-water pumped into the boiler per hour, while in the last of which, the steam being used without condensation, the total horse-power cost 26.2152 pounds of feed-water pumped into the boiler per hour. Hence, the use of the steam without condensation increased its economy $\left(\frac{28.0250 - 26.2152 \times 100}{28.0259} = \right)$ 6.46 per centum.

Comparing experiments H, Table No. 1, and V, Table No. 2, in both of which the steam was expanded 3.0793 times, and in the first of which, the steam being used with condensation, the total horse-power cost 28.5128 pounds of feed-water pumped into the boiler per hour, while in the last of which, the steam being used without condensation, the total horse-power cost 27.1753 pounds of feed-water pumped into the boiler per hour; hence, the use of the steam without condensation increased its economy $\left(\frac{28.5128 - 27.1753 \times 100}{28.5128} = \right)$ 4.69 per centum.

For comparison with the result of experiment X, Table No. 2, (there being no comparable experiment with the steam used with condensation and the same measure of expansion,) there must be interpolated a result between that of experiment K and that of the mean of experiments I and J, Table No. 1, which would have been obtained by expanding the steam 1.6283 times, the same as in experiment X. The result gives for the cost of the total horse-power 31.9079 pounds of feed-water pumped into the boiler per hour when the steam was used with condensation, while in experiment X, using the steam without condensation, this cost was 29.4639 pounds. Hence, the use of the steam without condensation increased its economy $\left(\frac{31.9079 - 29.4639 \times 100}{31.9079} = \right)$ 7.66 per centum.

Finally, comparing experiments K, Table No. 1, and Y, Table No. 2, in both of which the steam was expanded 1.3878 times, and in the first of which, the steam being used with condensation, the total horse-power cost 34.2660 pounds of feed-water pumped into the boiler per hour, while in the last of which, the steam being used without condensation, the total horse-power cost 31.5666 pounds of feed-water pumped into the

boiler per hour; hence, the use of the steam without condensation increased its economy $\left(\frac{34.2660 - 31.5666 \times 100}{34.2660} = \right)$ 7.88 per centum.

The percentum of gain due to the use of the steam without condensation does not appear, from these determinations, to be affected by the measure of expansion with which the steam is used. The average of the gains in the different experiments compared is 6.67 per centum. That is to say, the cost of the total horse-power in pounds of feed-water pumped into the boiler per hour when the steam is used without condensation is 6.67 per centum less than when the steam is used with condensation, other things being equal. This is the true commercial gain, and constitutes a very important fact. It is due entirely to the less condensation on the interior surfaces of the cylinder, arising from the less difference between the temperatures on the steam and exhaust strokes of the piston in the case of the non-condensing engine, as the temperature of steam increases in but a small ratio compared with corresponding increase in its pressure. In the experiments, the comparison is for a thoroughly steam-jacketed cylinder, which makes the above gain of 6.67 per centum a minimum; because such jacketing, by reducing the cylinder-condensation, leaves a less quantity to be acted on preventatively. Had the steam-jacketing been sufficiently efficacious to have entirely prevented condensation in the cylinder, no gain could have resulted for the non-condensing engine, and the total horse-power in it would have cost the same weight of feed-water per hour as in the condensing engine. The above gain permits a closer and more intelligent comparison to be made of the relative economy of the two systems of using steam, namely, with and without condensation; and it allows an accurate computation to be made of the initial cylinder pressure with which a non-condensing steam-engine will furnish a given mean pressure to the crank-pin per stroke of piston with the same cost of coal as a condensing engine using the steam with the same measure of expansion. Of course, the non-condensing engine requires higher steam-pressures in both boiler and cylinder than the condensing engine.

For example, with the non-condensing engine, there is avoided the expenditure of power required to overcome the friction of the air-pump and its connections, and to pump out the injection-water, air, and uncondensed vapor, an expenditure estimated in the aggregate and for the average of practice at about one-twelfth of the total power developed by the engine. Next, there is a difference of about 100° F. in the temperature of the feed-water in favor of the non-condensing engine, equivalent to, say, one-ninth of the fuel consumed with the condensing engine. Finally, the total horse-power is produced in the non-condensing engine for, say, one-sixteenth less expenditure of steam. The aggregate of these differences shows that the total horse-power in the non-condensing engine can be produced for, say, 25 per centum less fuel (not weight of steam) than in the condensing engine. This is the minimum gain, for the evaporative economy of the boiler will be increased by the higher temperature of the feed-water in a greater degree than is due to that temperature, because the same heating surface having to supply the feed-water with a less quantity of heat in a given time, this supplying will be performed with less loss of heat in the gases of combustion, more of this heat being taken up by the water, on account of the less quantity of it to be absorbed in the same time. Also the feed-water of higher temperature has a greater heat-absorbing quality, owing to its greater specific heat; and it has a greater rapidity of heat-convection, owing to its greater mobility, whereby the same boiler-surface becomes more efficacious in the transference of heat. As less feed-water, too, is used in proportion to power developed, there will be a proportional saving in the power expended in working the feed-pump. A further and not unimportant advantage can be given to the non-condensing engine by pumping into the boiler a certain proportion of air, which, passing into the cylinder intimately mingled with the steam, materially lessens the condensation of the latter on the metallic surfaces by excluding it from them. This air-mixing, which is inadmissible with a condensing engine, is more efficacious with cylinders not steam-jacketed than with those which are, because, in the former, there is less condensation to be thus prevented. With steam sufficiently superheated in the boiler, or with a sufficiently high pressure in the steam-jacket above the initial cylinder-pressure to prevent all condensation on the interior surfaces of the cylinder, no advantage would result from mixing of air; but as long as there is cylinder-condensation, and in proportion to its extent, will be the economy of air-mixing in the case of using steam without condensation.

On the other side, the expenditure of power required to pump a given weight of feed-water into the boiler is greater with the non-condensing engine on account of the greater boiler-pressure, and the loss of heat by external radiation from the boiler and cylinder surfaces is likewise greater than in the case of the condensing engine, on account of the higher temperature of the contained steam; but the differences will not be found material within the limits of practice, and with the coverings employed. If, now, the measure of expansion with which the steam be used is the same in both the condensing and non-condensing engines, and if the proportion of the sum of the back-pressure and friction-pressure to the mean total pressure during the stroke in the

cylinder be the same too, then the horse-power, both total and net, will be produced in the non-condensing engine for 75 per centum of the weight of fuel required in the condensing engine, and, with a cylinder whose area of piston is in the inverse ratio of the net pressure, when using the steam without condensation, to the net pressure when using it with condensation, the length of the stroke of the piston being the same.

The conditions just stated, however, would require boiler-pressures impracticably great, though attended with the important gain of 25 per centum in the fuel; so that it becomes of interest to know what boiler-pressures are required to give the net power for the same fuel when using the steam without condensation as when using it with condensation, the measure of expansion being the same in both cases.

For illustration, take the conditions of a condensing engine in experiment G, Table No. 1, in which an initial cylinder-pressure of 35.5 pounds per square inch above the atmosphere is expanded 3.6165 times, with a back pressure of only 2.61 pounds and a friction-pressure of 3.00 pounds per square inch of piston. The mean total pressure is 27.38 pounds per square inch above zero and the mean net pressure is 21.77 pounds. It is required to know the initial cylinder-pressure when using the steam without condensation, but, with the same measure of expansion, the same friction-pressure, and a back pressure of, say, 16 pounds per square inch above zero, that will give the net horse-power for the same expenditure of fuel per hour, supposing the total horse-power when using the steam without condensation to be obtained for three-fourths of the fuel expended when using the steam with condensation. An initial cylinder-pressure of 71.45 pounds per square inch above the atmosphere satisfies these conditions. This pressure gives for the co-efficient of expansion found in experiment G, namely, $\left(\frac{50.16}{27.38}=\right)$ 1.832, the mean total pressure of $\left(\frac{71.45+14.69}{1.832}=\right)$ 47.02 pounds per square inch above zero, which furnishes a net pressure of (47.02 − 16.00 + 3.00 =) 28.02 pounds per square inch of piston. The net horses-power obtained in the two cases with equal speed of piston compare as 21.77 to 28.02, or as 1.000 to 1.288. The respective mean total pressures, namely, 27.38 and 47.02, represent, with equal speed of piston, the total horses-power developed in the two cases; and as, in the latter case, the total horse-power was obtained for 75 per centum of the fuel required per hour in the former case, the weights of fuel consumed in equal time will compare as 27.38 and (47.02 × 0.75 =) 35.265, which are to each other as 1.000 to 1.288, the same ratio that the net horses-power were found to have. In the same manner, the computation can be made for any other measure of expansion, and the proper initial cylinder-pressure obtained for a non-condensing engine that will give the net horse-power for the same cost of fuel as required for the condensing engine with any given initial cylinder-pressure.

Of the effect on the economic development of the power produced by the absolute mean total pressure on the piston.—Did not the interior metallic surfaces of the cylinder alternately absorb and yield up heat—that is to say, were they unaffected by heat—the cost of the total horse-power would not be influenced by the absolute mean total pressure on the piston in pounds per square inch above zero, other things equal, but would remain the same, let that pressure be what it might, small or great. But as these surfaces are greatly affected by heat, serving alternately as condensers of the steam upon them and as vaporizers of the resulting water of condensation, their action produces a very marked effect upon the economic development of the power in function of the absolute mean total pressure when the cylinder is not steam-jacketed, that condition being attended with the greatest amount of condensation and re-evaporation, phenomena which disappear in the proportion that the cylinder is efficiently steam-jacketed, so that, when the cylinder is sufficiently steam-jacketed to nearly prevent condensation on its inner surfaces, the economic development of the total horse-power is no longer influenced by the high or low mean total pressure on the piston during its stroke, but is obtained for the same cost, irrespective of the amount of the pressure.

For instance: comparing the cost of the total horse-power in pounds of feed-water pumped into the boiler per hour during experiments D and F, Table No. 1, made without steam in the jackets, in both of which the steam was expanded 1.1068 times, but was used in experiment D with the mean total pressure on the piston of 28.49 pounds per square inch above zero, while, in experiment F, it was used with the mean total pressure on the piston of 13.70 pounds per square inch above zero, we find that in experiment D the total horse-power was obtained for 47.3411 pounds of feed-water pumped into the boiler per hour, while in experiment F this power was obtained for 52.5328 pounds, showing a loss of economy due to the employment of the lower total pressure of $\left(\frac{52.5328-47.3411\times 100}{47.3411}=\right)$ 10.97 per centum.

The reason why the condensation and re-evaporation produced by the inner metallic surfaces of the cylinder should more unfavorably affect the economic development of

the total horse-power with a lower mean total pressure than with a higher mean total pressure on the piston is that this condensation is a function of the area of the surfaces and the difference of temperature upon them. It is directly as the area of the surfaces; the difference of temperature, however, affects the problem in a comparatively subordinate degree, owing to the fact that the temperatures of steam of different pressures do not vary in anything like the ratio of the pressures, but in a greatly less ratio. Now the weight of steam in the cylinder per stroke of piston on which the condensing power of the surfaces is to act may be considered as in direct proportion to the total pressure, and as the surfaces remain constant, while the difference of temperature is far less than the difference of pressure, it is evident that the weight of steam condensed with increased pressure will increase in a very far less ratio than the weight of steam acted on, and thereby be a less and less per centum of the weight of steam used per stroke of piston in proportion as the pressure is higher and higher.

As a corollary to this deduction, it follows that the larger the cylinder, other things equal, the less is the per centum of condensation due to its inner metallic surfaces. For, supposing cylinders of the same length of stroke of piston, but of different diameters, it is evident that the weights of steam acted on per stroke will be in the ratio of the squares of the diameters, while the area of the inner metallic surfaces, which is the measure of the condensing power, will be in only the direct ratio of the diameters. According to this law, a cylinder of double diameter would have but one-half the per centum of condensation; but other causes enter into this problem, which is one of much complexity, and modify this simple result. The general direction, however, is in accordance with the law, but with results in a much lower proportion than is given by it. The principal modifying cause is probably the re-evaporation of the water of condensation, which, taking place partly during the steam-stroke of the piston under the decreasing pressure produced by the closing of the cut-off valve, allows the resulting steam to be utilized in the propulsion of the piston.

A confirmation of the principal deductions above is found in a comparison of the results of experiments L and M, Table No. 1, in both of which the steam was used with condensation, and expanded 1.1068 times, and all the jackets were filled with steam of a much higher pressure than the initial cylinder-pressure. In experiment L, the mean total pressure on the piston during its stroke was 26.90 pounds per square inch above zero, and the steam-pressure in the jackets was 10.64 pounds per square inch above the initial cylinder-pressure, while in experiment M the mean total pressure on the piston during its stroke was 12.43 pounds per square inch above zero and the steam-pressure in the steam-jackets was 37.87 pounds per square inch above the initial cylinder-pressure. In these cases the condensation by the inner metallic surfaces of the cylinder was so far nullified by the high temperature in the jackets, comparatively with the mean temperature in the cylinder, that the cost of the total horse-power was substantially the same in both, notwithstanding the mean total pressure in the one was more than double of the mean total pressure in the other, thus proving the great difference in the economy found accompanying a great difference in these pressures when the cylinder was not steam-jacketed, to be due wholly to the greater condensation in proportion to quantity of steam acted on condensingly per stroke of piston when the lower mean total pressure was used. In experiment L the total horse-power cost 38.9917 pounds of feed-water pumped into the boiler per hour, and in experiment M this power cost 38.5622 pounds. If the comparison be made by the pounds of steam entering the cylinder per hour per total horse-power, we have for experiment L 36.2501 pounds, and for experiment M 36.5403 pounds. These figures prove conclusively that, in proportion as condensation in the cylinder by its metallic surfaces is prevented, the influence of the absolute mean total pressure is reduced, becoming null when that condensation is reduced to a small per centum, and allowing the total horse-power to be obtained for the same cost, irrespective of the amount of the mean total pressure, whether the latter be large or small.

Of the steam-condensation produced by the inner metallic surfaces of the cylinder.—There are two condensations of steam in the cylinder which are entirely independent of external circumstances, and they are attributable to two entirely different causes. The one is the condensation due to the transmutation of a portion of the heat of the steam into the total power developed by the engine; the other is the condensation due to the varying temperatures of the inner metallic surfaces of the cylinder during a stroke of its piston and to the varying pressures upon them.

In unjacketed cylinders there is a condensation due to external circumstances, namely, the radiation of heat from the external surfaces of the cylinder; and the resulting water of condensation is formed on the inner surfaces, from which it is re-evaporated by its and their contained heat under the lessened pressure caused by the closing of the expansion-valve and by the opening of the exhaust-valve. This re-evaporation is a source of great economic loss additional to the loss by the condensation effected by the external radiation, as it reduces the temperature of the inner

metallic surfaces of the cylinder much below that of the entering steam from the boiler, a portion of which is condensed to furnish the heat required for raising the temperature of these surfaces to equality with that of the initial steam-pressure in the cylinder. Of course when the cylinder is steam-jacketed the radiation takes place from the external surfaces of the jacket instead of from those of the cylinder; and the water of condensation due to it, forming on the inner surface of the jacket and draining back to the boiler with the temperature of the boiler-steam, causes no other economic loss than that of its latent heat.

The waters foamed or primed over, or mechanically entrained by the steam from the boiler, as well as the water of condensation from the steam-pipe and valve-chest due to external radiation, are delivered into the cylinder of unjacketed engines, and, falling upon its inner metallic surfaces, from which they are evaporated by their contained heat and by the heat of the metal under the lessening pressures caused by the closing of the expansion-valve and the opening of the exhaust-valve, produce a considerable economic loss in the manner just explained for the water of condensation resulting from radiation by the external surfaces of the cylinder. In steam-jacketed engines the above waters of condensation can be delivered into the steam-jacket, together with the boiler-water mechanically brought over, and the whole can be returned to the boiler with the temperature of the boiler-steam, and without having been admitted to the cylinder, which, in this case, is supplied with steam from the jacket. A water-trap placed in the steam-pipe adjacent an unjacketed cylinder can, of course, be made to perform in this respect the function of a steam-jacket, but it is never employed.

The loss of heat by the steam due to the first cause cannot be prevented. It is properly no loss at all, being merely a transformation, without which no power could be developed in the engine. A part of the *vis viva* of the steam-molecules is transferred to the piston, which, moving in consequence of their impact, performs on some opposed resistance an equivalent of work. This kind of condensation takes place in the entire mass of steam, from the surface of the water in the boiler to the end of the stroke of the piston, when the steam is used without expansion; but when the steam is used with expansion, this condensation takes place from the surface of the water in the boiler up to the piston at the position occupied when the steam is cut off by the closing of the expansion-valve, after which it takes place in the cylinder alone; consequently the shorter the steam is cut off or the greater the measure of the expansion, the more of the condensation due to the development of the power takes place in the cylinder. This condensation does not occur on any surface and cannot be influenced by the presence of any surface, but extends uniformly throughout the whole mass of the steam, converting it into mist or fog by the equal diffusion of molecularly small particles of water. These particles of water, thus suspended, would, were sufficient time allowed, be precipitated by gravity upon whatever surfaces lay beneath them, but, this time being wanting in the action of a steam-engine, such precipitation does not take place, and the water-particles thus held in suspension are swept along with the steam through and out of the cylinder. The steam used in an engine, when not superheated, is, from this cause, always supersaturated, both in the boiler and in the cylinder. If the steam be not superheated in the boiler, or if it be not supplied when in the cylinder from some external source, as a steam-jacket, with the heat thus transformed into power as fast as the transformation occurs, the entire resulting condensation due to the development of power by the expansion of the steam alone after the closing of the expansion-valve, will be present in the cylinder and form a corresponding portion of its contents. Although the production of the water of condensation in the cylinder in the form of fog or mist, due to the development of the power, is not affected by the inner metallic surfaces of the cylinder, yet the heat-conditions of these surfaces are powerfully affected by this water of condensation, which thus becomes one of the most efficient causes of the enormous discrepancy between the economic gain proper to different measures of expansion, according to the Mariotte law, and the economic gain actually realized in steam-engines, even when employing steam jackets, or, what is still more efficient, using highly superheated steam. The greater the measure of the expansion, the more water-dense is the fog or mist, and, as the heat-absorbing and heat-giving-out action of the inner metallic surfaces of the cylinder are in some proportion to the weight of water mixed with the steam upon them, and as the temperature of the mixed water and steam is continually varying from that of the initial cylinder-pressure to that of the back-pressure against the piston, the quantity of steam condensed per stroke of piston by these surfaces and re-evaporated from them will be greater as the measures of expansion are greater. The simple reason why the water of condensation due to the development of the power affects the economy of the steam in the cylinder, causing an increased condensation by its surfaces and a correspondingly increased re-evaporation from them, is because such water of condensation converts the steam into a fog or mist, which has a greater heat-absorbing and heat-imparting power than pure steam, and greater with greater measures of expansion, because the water-density of the fog or mist increases with them; the metal of the cylinder will, therefore, during the first

part of the stroke of the piston, take up more heat from the steam of greater water-density, condensing, of course, a corresponding portion thereof, and, during the last part of the stroke will, by the re-evaporation of this water of condensation under the lessened pressure after the closing of the expansion-valve, be more cooled down.

Because the inner metallic surfaces of cylinders are conductors of heat, absorbing it from substances of higher temperature and yielding it to those of lower temperature, and because there is present upon these surfaces during a stroke of the piston steam of greatly differing pressure and temperature, therefore, whatever puts water in the cylinder, either suspended in the steam in a finely divided state or resting upon the surfaces in a mass, produces a condensation of the steam by causing the temperature of the surfaces to be lower when the steam-valve opens than that of the entering steam, which, consequently, has to raise them to its own temperature by a condensation sufficient to furnish the heat for that purpose. This effect is produced in the following manner: Suppose the inner surfaces of the cylinder at the opening of the steam-valve to have a lower temperature than that of the entering steam, which, consequently, will undergo condensation until the surfaces are raised to the temperature of this steam by the heat thus imparted, the resulting water of condensation deposited upon the surfaces having the temperature of the steam also. This continues—the piston advancing meanwhile—until the expansion-valve closes, after which—the piston advancing still—the pressure of the steam in the cylinder continuously diminishes until the piston reaches the end of its stroke, and under the diminishing pressure a continuous re-evaporation of the water of condensation takes place by means of its contained heat and that of the metallic surfaces, both of which fall in temperature by the abstraction. The steam produced by this re-evaporation is utilized in the propulsion of the piston, but the latter reaches the end of its stroke before all the water of condensation is vaporized. The exhaust-valve now opens, and the pressure in the cylinder falls to its minimum, namely, to nearly that of the condenser; and during the return or exhaust stroke *all* the water of condensation remaining in the cylinder when the steam-stroke was finished is re-evaporated, passing into the condenser without having produced any dynamic effect upon the piston except that of retarding its movement. The completion of the exhaust-stroke finds all the water of condensation vaporized and the temperature of the inner metallic surfaces of the cylinder reduced to that of the back-pressure vapor. The piston has now performed a double stroke and the cycle is complete. The steam-valve again opens, the boiler-steam flows in anew upon the cooled cylinder-surfaces, condensation commences, and the cycle is repeated as before. Were not all the water of condensation vaporized by the time the piston reaches the end of a double stroke, it would continually accumulate in the cylinder and soon bring the operations of the engine to a close, unless special contrivances were resorted to for removing it. The inner surfaces of a cylinder thus act alternately as a condenser and as a boiler, the metal of the cylinder by its heat-absorbing and its heat-imparting powers being the medium for passing a quantity of steam through the cylinder without the production of work, and, by thus causing a useless transfer of heat from the boiler to the condenser, greatly lessens the economic efficiency.

The beneficial effects of steam-jacketing result from its maintaining the cylinder-surfaces at the temperature of the boiler-steam, thereby preventing the condensation and consequent re-evaporation just described; and it is enabled to do this with but comparatively a very small expenditure of heat by the jacket. Its true action is to prevent, by the expenditure of a small quantity of heat, the commencement of a cycle of operations whose process generates great waste of heat. By preventing condensation at first, it prevents the subsequent re-evaporation to which is due the very low temperature of the cylinder-surfaces at the commencement of the stroke of the piston, which low temperature causes the great condensation of the entering boiler-steam.

As a consequence of the presence of a quantity of water in the cylinder when the piston has reached the end of its stroke, the quantities on line 59 of the tables are not quite accurate, being larger than the truth by the bulk of the water-particles diffused among the steam, and by the bulk of the water resting in mass on the cylinder-surfaces, as these surfaces were calculated from the steam-pressure at the end of the stroke of the piston, on the supposition that the entire contents of the cylinder was steam. The discrepancy, however, is too minute to be sensible, except in extreme cases, and even in them it is too small to be of any practical consequence, for, although the proportion by *weight* of water to steam may be considerable, yet the proportion by *volume* is quite inconsiderable. For example, in experiment A, Table No. 1, in which the steam was used without steam-jacketing and with the measure of expansion 3.6165—these being the conditions which produced the maximum quantity of water in the cylinder—the weight of steam entering the cylinder per stroke of piston was 0.08338871 pound, and the weight of steam present in it at the end of the stroke of the piston was 0.04084894 pound, the difference of 0.04253977 pound being water. But the relative volumes of the same weight of water and of steam of the pressure at the end of the stroke of the piston are 1 and 1689; consequently the relative volumes of

the water and steam present in the cylinder at the end of the stroke of the]
were (0.04253977 × 1 =) 0.04253977 and (0.08338871 × 1689 =) 140.84353119, or a
3311. The utmost error in the quantities on line 59 is, accordingly, only $\frac{1}{33}$th f
maximum case.

At the first glance it almost exceeds belief that nearly one-half of the steam gene
in the boiler could be condensed in the cylinder during the steam-stroke
piston. Yet this was unquestionably the fact in experiment A, Table No. 1, in
the conditions were highly favorable for such a result, the steam being cut off a
fourth of the stroke of the piston from the commencement, and used with cond
tion and without steam-jacketing. Of this enormous percentage, only a very
quantity was caused by external refrigeration, for the water of condensation
drawn from the steam-jackets, and which includes not only what results from
nal radiation, but also what is due to the loss of the heat imparted by the jac
the interior surfaces of the cylinder, does not, at the maximum, attain 6½ per ce
After consideration, however, the fact will not seem so incredible, because the cond
tion of pure steam is practically instantaneous. By "pure steam" is meant satu
steam unmixed with air. When air is mingled with the steam, the condensation i
cylinder is slower, and such a mixture up to a certain proportion in the case of a
condensing engine materially increases the economy of the steam in the cyl
Even with a condensing engine, the less condensation in the cylinder due to a
mixture up to a certain proportion helps to compensate, and may entirely compe
the loss by the impaired vacuum. It is understood, however, that the air in thi
must come with the steam from the boiler, and not be the result of leakage
the condenser.

Again, the rate of the re-evaporation of the water of condensation in the cy
by its contained heat and the heat of the interior metallic surfaces must not be j
of by the rate with which water evaporates under normal pressures by the gr
impartation of heat. In the cylinder the conditions are wholly different. Ther
water of condensation to be vaporized has a temperature abnormally very high t
of the boiling-point under the back pressure against the piston; the metallic su
have also the same high relative temperature; consequently the heat, instead of h
to be gradually generated and imparted, is already present and partly within the
while the low relative pressure upon the water permits the separation of the steam a
without resistance. Under these circumstances there occurs, as might be expect
excessively sudden vaporization of the water, so that the observed phenomena
cylinder, of the enormously rapid condensation and re-evaporation of steam, are
what might have been predicted by an intelligent comprehension of the cond
existing there. It is well known that nearly the whole of the steam generated
boiler is instantaneously condensed in a jet-condenser of one-third the capacity
cylinder. The condensation in a surface-condenser is likewise practically ins
neous; and although in this case the extent of surface employed enormously ex
that in the cylinder, yet the longer time during which the latter acts compensat
its lesser area and higher temperature. In fact, of the whole time, one-half is
pied in making the steam-stroke of the piston, and the other half is occupied in
ing the exhaust-stroke; during the first half the condensation is effected, and d
the last half the re-evaporation is accomplished.

Of the quantity of steam condensed in the jackets.—On line 65 of Tables Nos. 1
will be found the per centum of the steam evaporated in the boiler condensed
steam-jackets; and it will be observed that, *ceteris paribus*, this per centum dec
as the measure of expansion with which the steam is used decreases. In other
the less expansively the steam is used, the less is the condensation in the ja
showing that the refrigeration in the cylinder is the greater as the steam is used
the greater measure of expansion. In none of the strictly comparable experime
which the steam was used with condensation, namely, those from G to L, both incl
Table No. 1, does this condensation exceed 6½ per centum which it attains in e
ment G, the steam being cut off at 0.25 of the stroke of the piston from the comm
ment; while in experiment L, in which the steam was cut off at 0.90 of the str
the piston from the commencement, the condensation in the jacket falls to
centum. Now, when it is considered that these small condensations measu
only the heat imparted to the cylinder but also that imparted to the external
radiation, the remarkable fact appears that by the expenditure of so trifling a qu
of heat in the steam-jackets, so enormous a condensation in the cylinder is saved.
an effect can only be produced by the heat derived from the jackets acting prevent
The prevention of the condensation of steam upon the interior surfaces of the cy
avoids the re-evaporation therefrom of the water of condensation that would
resulted, and eliminates the enormous cooling influence of such re-evaporation
the metal of the cylinder.

It is to be regretted that the condensation in the jackets, due to external rad
alone, was not ascertained for the different experimental conditions, which might
have been done, so that this quantity might have been separated from the quanti

to the heat imparted to the cylinder. The amount, however, would have been insignificant, not exceeding one per centum of the boiler-evaporation, so that without practical error nearly the entire jacket-condensation may be assumed as measuring the quantity of heat imparted to the interior surfaces of the cylinder.

There may be here remarked that the per centum of the steam evaporated in the boiler condensed in the jacket is by no means the per centum of the heat imparted to the water in the boiler, the loss of heat by the condensation in the jackets being only that of the latent heat of the steam, whereas the heat imparted to the water in the boiler is the total heat of evaporation above the temperature of the feed-water; consequently, the losses of heat by the jacket-condensations in experiments G and L above referred to, are very much less respectively than 6¼ and 3¾ per centum of the fuel. But, on the contrary, the per centum of the steam evaporated in the boiler that is condensed in the cylinder, expresses also the per centum of the heat imparted to the water in the boiler lost by such condensation; the water of the latter being returned to the boiler at the condenser-temperature, which is likewise the temperature of the feed-water in ordinary practice.

The average quantity of steam condensed in the jackets when the steam was used in the cylinder with condensation, is about 5 per centum of the quantity evaporated in the boiler, of which 5 about 4 are due to the prevention of cylinder-refrigeration, and represents an expenditure of about 3 per centum of the fuel.

Relative economic efficiency of the steam when used with different measures of expansion.—The experiments were made with the measures of expansion due to cutting off the steam at 0.25, 0.30, 0.50, 0.60, 0.66+, 0.75, and 0.90 of the stroke of the piston from the commencement. These measures, including the effect of the spaces in the cylinder-clearance, steam-passage, &c., were respectively 3.6165, 3.0793, 1.9317, 1.6283, 1.4737, 1.3178, and 1.1068; that is to say, the steam was expanded those numbers of times. With these measures of expansion the experiments were made for the cases of using the steam with and without condensation, and with and without steam-jacketing, the governing conditions in all, with the exception of experiments E, F, and L, being the development of about equal net horses-power by the engine. In those three experiments, the net powers developed by the engine were less than half that developed in the others.

In the following table, No. 3, will be found the economic results due to the use of the steam with the different measures of expansion and for the different cases. The results are given both absolutely and relatively for the cost of the total horse-power developed by the engine, in pounds of feed-water consumed per hour.

In all the experiments except A, B, C, and D, in which the steam was used with steam-jacketing, the water of condensation from the valve-chest did not pass through the cylinder, having been previously drawn off; there was, consequently, prevented in them the economic loss due to the re-evaporation of such water from the interior surfaces of the cylinder, equal, according to the experiments, to 10.38 per centum of the cost of the power when this water was not drawn off. To render, then, the results from experiments A, B, C, and D, comparable with those from the other experiments, a correction for this 10.38 per centum has been made.

In only one case, that of using the steam without steam-jacketing, was the steam cut off at 0.90 of the stroke of the piston from the commencement; this gave the smallest measure of expansion used, but, in each of the other cases, the smallest measure of expansion used was that due to cutting off the steam at 0.75 of the stroke of the piston from the commencement; therefore to render the expansion-results comparable throughout the table, their relative economies have been calculated for equality at the 0.75 point of cutting off.

Table No. 3, containing the absolute and relative economic efficiencies due to using the steam with the different measures of expansion. for the total horse-power in pounds of feed-water pumped into the boiler per hour.

Measure of expansion.		Relative and economic efficiencies.							
Fraction of stroke of the piston completed when the steam was cut off.	Number of times the steam was expanded.	Steam used with condensation, and without steam-jacketing. Experiments A, B, C, and D.		Steam used with condensation and with steam-jacketing with steam of the boiler-pressure. (Experiments G, H, I, J, and K.)		Steam used with condensation and with steam-jacketing with high-pressure steam from an auxiliary boiler. (Experiments N, O, and P.)		Steam used without condensation and with steam-jacketing with steam of the boiler-pressure. (Experiments U, V, X, and Y.)	
		Pounds of feed-water pumped into the boiler per hour per total horse-power.		Pounds of feed-water pumped into the boiler per hour per total horse-power.		Pounds of feed-water pumped into the boiler per hour per total horse-power.		Pounds of feed-water pumped into the boiler per hour per total horse-power.	
		Absolute.	Relative.	Absolute.	Relative.	Absolute.	Relative.	Absolute.	Relative.
0.25	3.6165	34.6232	0.8186	28.0250	0.7187	.....	.....	26.2152	0.7392
0.30	3.0793	.....	.....	28.5128	0.7313	25.2854	0.7388	27.1753	0.7566
0.50	1.9317	36.8615	0.6664	30.3358	0.7780	28.1375	0.8221	.....	.....
0.60	1.6283	.....	.....	.....	.....	.....	.....	29.4639	0.8123
0.66+	1.4737	38.9319	0.9162	.....	.....	.....	.....	.....	.....
0.75	1.3178	.....	.....	34.2660	0.8788	30.0776	0.8788	31.5666	0.8788
0.90	1.1068	42.5448	1.0000	38.9917	1.0000	.....	.....	.....	.....

By taking from the above Table No. 3 the data in the columns headed "Relative," with the exception of that belonging to the first case, namely, the one in which the cylinder was not steam-jacketed, and laying them off as right-angled ordinates to a base whose abscissæ are the fractions of the stroke of the piston completed when the steam was cut off, (first column of Table No. 3,) and then drawing a fair curve through the free ends of the ordinates, we can ascertain the relative economic efficiencies with steam-jacketing of all the measures of expansion included between those due to cutting off the steam at 0.25 and 0.90 of the stroke of the piston from the commencement by simply measuring the length of the line, at right angles to and at any desired point of cutting off on the base, included between the base and curve. In this manner the following table, No. 4, has been constructed, the points of cutting off increasing by 0.05 from 0.25 to 0.90 of the stroke of the piston from the commencement.

TABLE No. 4.—*Containing the relative economic efficiencies of steam-jacketed steam, in function of the total horse-power and of the feed-water pumped into the boiler, used with the measures of expansion due to points of cutting off increasing by* 0.05 *of the stroke of the piston between* 0.25 *and* 0.90 *of the stroke from the commencement.*

Fraction of the stroke of the piston completed when the steam was cut off.	Relative economic efficiency of the steam.	Fraction of the stroke of the piston completed when the steam was cut off.	Relative economic efficiency of the steam.	Fraction of the stroke of the piston completed when the steam was cut off.	Relative economic efficiency of the steam.
0.25	0.7262	0.50	0.7827	0.75	0.8787
0.30	0.7357	0.55	0.7970	0.80	0.9129
0.35	0.7457	0.60	0.8124	0.85	0.9527
0.40	0.7572	0.65	0.8312	0.90	1.0000
0.45	0.7697	0.70	0.8527	.....	.....

The determinations in the foregoing Tables Nos. 3 and 4 are, it will be observed, for the economic efficiency of steam-jacketed steam as measured by the cost of the total indicated horse-power *in pounds of feed-water pumped into the boiler per hour.* These are the commercial results, and represent, *ceteris paribus*, the respective weights of fuel required to produce the total horse-power under the conditions stated. But it will be very instructive for the engineer to know the relative economic efficiency of steam-jacketed steam when used with different measures of expansion, as measured by the cost of the total indicated horse-power *in pounds weight of steam entering the cylinder per hour.* This eliminates the cost of whatever effect is produced by the steam-jacketing,

and it also eliminates the cost of the heat lost by external radiation from the valve-chest and steam-pipe.

In the following Table No. 5 these determinations are given both absolutely and relatively in the same manner as in Table No. 3. In the first case, namely, that of using the steam without steam-jacketing, the weights of steam consumed per hour per total horse-power are those that would have been expended had the water of condensation in the valve-chest been drawn off and not permitted to enter the cylinder. Thus, all the results in the table are for the condition of no water entering the cylinder with the steam.

TABLE No. 5.—*Containing the absolute and relative economic efficiencies due to using the steam with different measures of expansion for the total horse-power in pounds weight of steam entering the cylinder per hour.*

Measure of expansion.		Relative and economic efficiencies.							
Fraction of the stroke of the piston completed when the steam was cut off.	Number of times the steam was expanded.	Steam used with condensation and without steam-jacketing. Experiments A, B, C, and D.		Steam used with condensation and with steam-jacketing with steam of the boiler-pressure. Experiments G, H, I, J, and K.		Steam used with condensation and with steam-jacketing with high-pressure steam from an auxiliary boiler. Experiments N, O, and P.		Steam used without condensation and with steam-jacketing with steam of the boiler-pressure. Experiments U, V, X, and Y.	
		Pounds weight of steam entering the cylinder per hour per total horse-power.		Pounds weight of steam entering the cylinder per hour per total horse-power.		Pounds weight of steam entering the cylinder per hour per total horse-power.		Pounds weight of steam entering the cylinder per hour per total horse-power.	
		Absolute.	Relative.	Absolute	Relative.	Absolute.	Relative.	Absolute.	Relative.
0.25	3.6165	33.4766	0.8484	24.8437	0.6854	.....	.....	23.6422	0.6873
0.30	3.0793	.....	.....	25.5125	0.7038	22.0481	0.7002	24.9016	0.7239
0.50	1.9317	37.6367	0.8605	27.3650	0.7549	25.4365	0.8077	.....	.....
0.60	1.6283	.....	.....	.....	.....	.....	.....	27.7823	0.8077
0.66+	1.4737	37.8245	0.9134	.....	.....	.....	.....	.....	.....
0.75	1.3178	.....	.....	31.6116	0.8720	27.4605	0.8720	29.9963	0.8720
0.90	1.1068	41.4114	1.0000	36.2501	1.0000	.....	.....	.....	.....

The following Table No. 6 has been constructed from the above Table No. 5, in exactly the same manner as the preceding Table, No. 4 was constructed from its predecessor, Table No. 3; and shows the relative economic efficiency, per total horse-power, of the steam entering the cylinder per hour, for measures of expansion between those due to cutting off at 0.25 of the stroke of the piston from the commencement to those due to cutting off at 0.90; the points of cutting off increasing by 0.05 of the stroke of the piston, and the cylinder being steam-jacketed.

TABLE No. 6.—*Containing the relative economic efficiencies of steam-jacketed steam, in function of the total horse-power and of the weight of steam entering the cylinder, used with the measures of expansion due to points of cutting off increasing by* 0.05 *of the stroke of the piston between* 0.25 *and* 0.90 *of the stroke from the commencement.*

Fraction of the stroke of the piston completed when the steam was cut off.	Relative economic efficiency of the steam.	Fraction of the stroke of the piston completed when the steam was cut off.	Relative economic efficiency of the steam.	Fraction of the stroke of the piston completed when the steam was cut off.	Relative economic efficiency of the steam.
0.25	0.7262	0.50	0.7827	0.75	0.8787
0.30	0.7357	0.55	0.7970	0.80	0.9129
0.35	0.7457	0.60	0.8124	0.85	0.9527
0.40	0.7572	0.65	0.8312	0.90	1.0000
0.45	0.7697	0.70	0.8527	.....	.....

From the preceding Tables No. 3 to No. 6, both inclusive, the following general conclusions are warranted:

1st. That the cost of the total horse-power in pounds of feed-water pumped into the boiler per hour, or what is the same thing, in pounds of steam evaporated in the boiler per hour, is less as the measure of expansion is greater.

2d. That the economic gain due to the greater measures of expansion with

which the steam was used is enormously less than it should have been according to the Mariotte law; the cost of the total horse-power when the steam was expanded 3.6165 times being (Table No. 3) in the most favorable case with steam-jacketing (experiment G) only 28.13 per centum less than when the steam was expanded but 1.1068 times, (experiment K.)

3d. That the economic gain by the use of greater measures of expansion does not increase by steam-jacketing the cylinder with steam of very greatly higher pressure (taken from an auxiliary boiler, experiments N, O, and P) than the boiler-pressure, over that obtained by steam-jacketing with steam of the boiler-pressure, (experiments G, H, I, J, and K.)

That is to say, although the total horse-power for any given measure of expansion is obtained for a less absolute weight of steam consumed per hour, the greater the difference between the boiler-pressure and the initial steam-pressure in the cylinder, yet the gain due to a larger measure of expansion over the cost with a smaller measure is no greater with excessively high pressures in the jacket than with simply the boiler-pressure. In other words, if, when the cylinder is jacketed with steam of the boiler-pressure, there is a gain of say 20 per centum between cutting off at, say, half-stroke, and at nine-tenths of the stroke; then, there will be only the same gain between these two points of cutting off when the cylinder is jacketed with steam of very much greater pressure than the boiler-pressure, furnished, say, by an auxiliary boiler.

4th. That the economic gain by the use of greater measures of expansion is not as much when the cylinder is not steam-jacketed as when it is. For illustration, (Table No. 3,) the gain by cutting off at 0.25 of the stroke of the piston from the commencement, over the cost of the total horse-power when cutting off at 0.90 of the stroke, the cylinder being steam-jacketed, is 28.13 per centum, and, when the cylinder was not steam-jacketed, only 18.14 per centum.

5th. That the very small gain experimentally obtained from the large measures of expansion, comparatively with the gain which should have been obtained according to the Mariotte law, even under the extremely favorable conditions of Table No. 5, for the case of "steam used with condensation and with steam-jacketing with high-pressure steam from an auxiliary boiler, experiments N, O, and P," the temperature of the steam in the jacket in this case being so high as to prevent all condensation in the cylinder other than that due to the development of the power, and the cost of the total horse-power being given in only the pounds-weight of steam which entered the cylinder per hour, proves the utter futility of the expectations of gain based on this law, when applied to steam in a practical steam-engine, and shows the expansion of this vapor to be governed by such very different laws from that of the perfect gases, that no inferences drawn from them can be predicated of it.

The condition to which all the foregoing remarks on the economic efficiency of steam used with different measures of expansion applies is for equal powers, total and net, developed in the same cylinder with equal friction-pressure and back-pressure against the piston, the initial pressure in the cylinder being so much less as the measure of expansion is greater. But there is another condition from which entirely different economic results will be obtained, namely, that of equal speed of piston, equal initial steam-pressure in the cylinder, equal friction-pressure, and equal back-pressure against the piston, but with the development of less and less powers, total and net, as the measure of expansion with which the steam is used is greater and greater.

Were there no back-pressure against the piston, and had the moving parts of the engine no friction, then the cost of the net power, which in that case would also be the total power, would be unaffected except by the greater proportional condensation taking place in the same cylinder with lower average pressures, and not even that in a thoroughly steam-jacketed cylinder; but it is easy to understand that the existence of back-pressure and friction-pressure greatly modifies the results when the total pressure is greatly variable, for the back-pressure and friction-pressure, being constant, become a greater and greater proportion of the total pressure as the latter becomes less and less by the same initial pressure being cut off shorter and shorter. The powers corresponding to the back-pressure and friction-pressure being occupied in overcoming useless resistances of the mechanism itself, the remainder or net power is all that is commercially valuable, being the only part of the total power employed in doing external work. Hence, while the cost of the total power may, under all conditions, with the steam used with the same measure of expansion, be kept practically constant, the cost of the net power may vary enormously, so much so as to reverse the superior economic efficiency of the greater measures of expansion, in function of the total power, and make the smaller measures more economical in function of the net power.

In the following table, No. 7, the effect of this modification is shown for the experimental conditions. It is assumed that the maximum experimental initial pressure in the cylinder, (line 37, Tables Nos. 1 and 2,) 50 pounds per square inch above zero, is constant throughout and sustained to the point of cutting off the steam; that the friction-pressure is constantly 2 pounds per square inch of piston; and that the back-pressure against the piston is uniformly 3 pounds per square inch of piston above zero.

The area of the piston being assumed at unity, and its speed in feet per minute being assumed at unity also, the pressures on the piston express their corresponding powers.

In Table No. 7, line 1 gives the fraction of the stroke of the piston, completed when the steam is cut off; and line 2 shows the corresponding number of times the steam is expanded, including the effect of the spaces in the clearance and steam-passage of the cylinder.

Line 3 gives the area of the piston, considered as unity throughout; and line 4 gives the speed of the piston, considered also as unity throughout.

Line 5 gives the constant initial pressure in the cylinder of 50 pounds per square inch above zero. Line 6 gives the constant back-pressure against the piston of 3 pounds per square inch above zero; and line 7 gives the constant friction-pressure of 2 pounds per square inch of piston.

Line 8 gives the mean total pressure on the piston during its stroke, in pounds per square inch. It is calculated according to the Mariotte law for each measure of expansion, and includes the effect of the steam in the clearance and steam-passage of the cylinder. The numbers on line 9 are the same as those on line 8, and express relatively the number of total horses-power developed by the engine for the pressures on line 8.

Line 10 contains the net pressures on the piston in pounds per square inch for the different measures of expansion; they are the remainders of the quantities on line 8 after deduction of the sum of the quantities on lines 6 and 7. The numbers on line 11 are the same as those on line 10, and express relatively the number of net horses-power developed by the engine for the pressures on line 10.

Line 12 gives relatively the cost of the total horse-power in weight of feed-water pumped into the boiler per hour for the different measures of expansion. These quantities are taken from the previous table, No. 4. Line 13 gives relatively the cost of the total horse-power in weight of steam entering the cylinder per hour for the different measures of expansion. These quantities are taken from the previous table, No. 6.

Line 14 contains the relative weights of feed-water pumped into the boiler per hour. These quantities are the products of the multiplication of those on line 9 by those on line 12. Line 15 contains the relative weights of steam entering the cylinder per hour. These quantities are the products of the multiplication of those on line 9 by those on line 13.

Line 16 gives the relative cost for the different measures of expansion of the net horse-power in weight of feed-water pumped into the boiler per hour. These quantities are the quotients of the division of those on line 14 by those on line 11. Line 17 gives the relative cost for the different measures of expansion of the net horse-power in weight of steam entering the cylinder per hour. These quantities are the quotients of the division of those on line 15 by those on line 11.

The quantities on line 16 are the commercially correct relative costs of the net horse-power in weight of fuel consumed per hour, under the conditions of the assumed constant initial, back, and friction pressures in the cylinder, for the steam used with the different measures of expansion in a thoroughly steam-jacketed cylinder. Under these conditions, there was no sensible economy in cutting off shorter than 0.40 of the stroke of the piston from the commencement, corresponding to expanding the steam 2.3741 times; and the loss by following with the steam much farther is so little that when cutting off at 0.60 of the stroke of the piston from the commencement, corresponding to expanding the steam 1.6283 times, the difference in the economy between that measure of expansion and the previous one of 2.3741 times is only $\left(\frac{0.9126-0.8689\times 100}{0.9126}=\right)$ 4.8 per centum.

The determinations, however, on line 16, are very much too favorable for the greater measures of expansion, because they are only for the condensations in the same sized cylinder in which equal total powers were developed with the different measures of expansion and *unequal* initial pressures in the cylinder, such being the experimental conditions under which the cost of the total horse-power, lines 12 and 13, was obtained. But, when *equal* initial pressures are used in the cylinder, then, in order to develop equal net powers with the different measures of expansion, the area of the piston (its stroke remaining the same) must be increased in the inverse ratio of the mean net pressures on line 10, so that the greater measures of expansion would require greater cylinders, and the greater cylinders would produce greater condensations, by reason of their greater interior surfaces, and to such an extent as to make the gain of 4.8 per centum above shown in favor of cutting off at 0.40 over cutting off at 0.60 of the stroke of the piston from the commencement, to entirely disappear, or, possibly, to be reversed.

These experiments, then, show that with even a thoroughly steam-jacketed cylinder, and steam of 50 pounds per square inch above zero initial pressure upon the piston, the sum of the back and friction pressures being only 5 pounds per square inch, there is no economic gain of fuel to be obtained by using the steam with a greater measure of expansion than 1.6283 times, corresponding to cutting it off at 0.60 of the stroke of the piston from the commencement.

TABLE NO. 7.—*Showing, in function of the net horse-power developed by the engine, the relative economic efficiency of steam used in a steam-jacketed cylinder, with constant initial pressure upon the piston, a constant back-pressure and friction-pressure against it, but with different measures of expansion; the relative cost of the net horse-power being given for the two cases of the weight of feed-water pumped into the boiler per hour and the weight of steam entering the cylinder per hour.*

1	Point of cutting-off the steam from the commencement of the stroke of the piston	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90
2	Number of times the steam was expanded	3.6165	3.0793	2.6811	2.3741	2.1302	1.9317	1.7671	1.6283	1.5097	1.4072	1.3178	1.2390	1.1693	1.1068
3	Area of the piston	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
4	Speed of the piston	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
5	Initial steam-pressure in the cylinder in pounds per square inch above zero	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.	50.
6	Back-pressure against the piston in pounds per square inch above zero	3.	3.	3.	3.	3.	3.	3.	3.	3.	3.	3.	3.	3.	3.
7	Pressure required to overcome the friction of the engine *per se*, in pounds per square inch of piston	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
8	Mean total pressure on the piston during its stroke, in pounds per square inch above zero	30.92	33.93	36.56	38.88	40.90	42.67	44.20	45.52	46.64	47.58	48.36	48.84	49.43	49.75
9	Relative number of total horses-power developed by the engine	30.92	33.93	36.56	38.88	40.90	42.67	44.20	45.52	46.64	47.58	48.36	48.84	49.43	49.75
10	Mean net pressure on the piston during its stroke, in pounds per square inch	25.92	28.93	31.56	33.88	35.90	37.67	39.20	40.52	41.64	42.58	43.36	43.84	44.43	44.75
11	Relative number of net horses-power developed by the engine	25.92	28.93	31.56	33.88	35.90	37.67	39.20	40.52	41.64	42.58	43.36	43.84	44.43	44.75
12	Relative cost of the total horse-power, in weight of feed-water pumped into the boiler per hour	0.7262	0.7357	0.7457	0.7572	0.7697	0.7827	0.7970	0.8124	0.8312	0.8527	0.8787	0.9129	0.9527	1.0000
13	Relative cost of the total horse-power, in weight of steam entering the cylinder per hour	0.6996	0.7137	0.7270	0.7404	0.7548	0.7704	0.7868	0.8037	0.8229	0.8462	0.8737	0.9079	0.9504	1.0000
14	Relative weights of feed-water pumped into the boiler per hour	22.4541	24.9623	27.2628	29.4399	31.4807	33.3978	35.2274	36.9804	38.7672	40.5715	42.4939	44.5860	47.0920	49.7500
15	Relative weights of steam entering the cylinder per hour	21.6316	24.2158	26.5791	28.7867	30.8713	32.8730	34.7766	36.5844	38.3800	40.2522	42.2521	44.3418	46.9783	49.7500
16	Relative cost of the net horse-power, in weight of feed-water pumped into the boiler per hour	0.8663	0.8628	0.8638	0.8689	0.8769	0.8866	0.8987	0.9126	0.9310	0.9528	0.9800	1.0170	1.0509	1.1117
17	Relative cost of the net horse-power, in weight of steam entering the cylinder per hour	0.8346	0.8370	0.8422	0.8497	0.8599	0.8727	0.8872	0.9029	0.9217	0.9453	0.9744	1.0114	1.0571	1.1117

RESSURE,

AS OPERATED.

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external air.....
engine room .....
sea water..... .
discharge water..
hot well .....
feed water by tanl

f the vaporization by the boiler.—The aggregate duration of the experiments was 810 ıre, in which time there were consumed 36,236.50 pounds of excellent anthracite, ing 16.04 per centum of refuse in ash, clinker, dust, &c., which, being deducted, left 25.25 pounds of combustible or rather gasifiable matter. The total quantity of er which this amount of fuel would have evaporated, had the water been supplied he temperature of 100° F., and vaporized under the standard atmospheric pressure, 324,522.3596 pounds. And, had the water been supplied at the temperature of F., and vaporized under the standard atmospheric pressure, the quantity would been 362,422.7176 pounds. The ratio of the water-heating to grate-surface of the er was so large, and the rate of combustion of the fuel was so slow—in no experi- t reaching 10 pounds of anthracite per hour per square foot of grate—that the ations in the rate of combustion for the different experiments produced no varia- in the economic results in function of that rate. Other causes operated to vary economic results from the fuel within the limits of 11.3433 and 12.4269 pounds of r, supplied at the temperature of 212° F., and vaporized under the standard atmos- ic pressure per pound of combustible; the difference amounting to 8.80 per centum e larger quantity, 9.55 per centum of the smaller quantity, and 9.12 per centum of mean.

e following are the mean results:

ds of water vaporized per hour from 100° F., and under the atmospheric pressure	400.6449
ds of water vaporized per hour from 212° F., and under the atmospheric pressure	447.4354
ds of anthracite consumed per hour	44.7364
ds of combustible consumed per hour	37.5620
entum of the anthracite in refuse of ash, clinker, dust, &c	16.04
ds of anthracite consumed per hour per square foot of grate-surface	6.2134
ds of anthracite consumed per hour per square foot of heating-surface	0.1549
ds of combustible consumed per hour per square foot of grate-surface	5.2170
s of combustible consumed per hour per square foot of heating-surface	0.1301
s of water vaporized from 100° F. by one pound of anthracite	8.9557
s of water vaporized from 100° F. by one pound of combustible	10.6662
s of water vaporized from 212° F. by one pound of anthracite	10.0016
s of water vaporized from 212° F. by one pound of combustible	11.9119

Very respectfully, your obedient servant,

B. F. ISHERWOOD,
Chief Engineer.

28, 1875.

eer-in-Chief WM. W. W. WOOD, U. S. N.,
ief of the Bureau of Steam-Engineering, Navy Department.

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port of the trial of the steam-machinery of the United States revenue steamer Gallatin, e United States navy-yard, Boston, Mass., in the months of December and January, -75, embodying a summary of the general results of experiments with the steam-machinery ited States revenue steamers Rush, Dexter, Dallas, and Gallatin.

trial of the United States revenue steamers Rush, Dexter, and Dallas, in the of August, 1874—reports of which were transmitted to the United States Navy easury Departments, and shortly after widely circulated—furnished much valu- formation as to the relative cost of the power in compound and non-compound , operated with the same and different steam-pressures at various degrees of ion; but the comparison could not, with these vessels, be made in all respects te, for the reason that the cylinders of the compound engine were steam-jack- hile those of the non-compound engines were not jacketed. At that time, how- ew machinery was in process of construction for the United States revenue Gallatin, of substantially the same power as that of each of the other vessels, linder for which was steam-jacketed and the boiler designed to carry a high e of steam. Upon the completion of the Gallatin, it was arranged by the Navy easury Departments to make a series of experiments with her machinery on the ystem as the other vessels were tried, and under the general direction of the ersons, (the undersigned.)

DESCRIPTION OF THE GALLATIN.

Gallatin is an iron screw steamer, with topsail-schooner rig, 147 feet long over feet between perpendiculars at water-line, 23 feet beam, and 9 feet 6 inches f hold from top of cross floors to under side of main deck The draught of ft is about 9½ feet.

essel was modeled and constructed by Mr. David Bell, of Buffalo, N. Y., in the

year 1870, and by direction of the Department was at first fitted with a steering propeller and machinery adapted for operating the same. The vessel was rebuilt by the same party in the year 1874, and provided with a screw-propeller and new steam-machinery throughout, (except surface-condenser,) designed by Charles E. Emery, consulting engineer, some details of engine being adapted to the style of the builder, so that the patterns would be of service to him for future use. With the new machinery the vessel, which has an excellent model, steams readily upward of eleven nautical miles per hour.

MACHINERY.

Boiler.

The vessel has one boiler of the ordinary American flue and return-tubular, circular-shell type, constructed of heavy iron, and strongly braced, of the following general dimensions and proportions:

Length of boiler	15 feet 9 inches.
Width of front and diameter of circular shell	10 feet.
Height of boiler to top of circular shell	10 feet 3 inches.
Diameter of steam-chimney	6 feet 6 inches.
Diameter of steam-chimney flue	3 feet 6 inches.
Height of steam-chimney above shell of boiler	7 feet.
Number of furnaces	2
Direct flues: two of 28 inches, two of 18 inches, two of 12 inches diameter; all 3 feet 7 inches long.	
Return tubes, 124 in number, each 3¼ inches in diameter and 10 feet 9 inches long.	
Length of back connection	2 feet.
Length of front connection	2 feet 6 inches.
Grate surface	55.25 sq. ft.
Gross area of tubes for draught	7.20 sq. ft.
Water-heating surface	1,805.163 sq. ft.
Steam-heating surface	105.311 sq. ft.
Ratio of cross area of tubes to grate surface	7.68
Ratio of grate to heating surface	32.6
Ratio of cross area of tubes to heating surface	250.98
Ratio of cross area of tubes to steam space, (9 inches above tubes)	52.2

Engine.

There is one main engine, of the inverted type, with steam-jacketed cylinder 34.1 inches in diameter, with 30 inches stroke of piston. The comparatively short stroke was necessarily adopted in the design to bring the main cylinder under the hurricane-deck. Steam is distributed by a short slide-valve, arranged to cut off by lap at two-thirds of the stroke, and provided with adjustable cut-off plates sliding on its back. The air-pump is operated through levers from the main cross-head. The surface-condenser case does not form part of the engine-frame, but is set on a separate foundation near the side of the vessel, and connected to air-pump by a pipe. The circulating pump is of the centrifugal type, of sufficient size to supply the necessary quantity of water at all times, with a speed of less than 200 revolutions per minute. It is operated by a vertical engine, with cylinder 4 inches in diameter and 6 inches stroke, directly connected to pump-shaft. The screw-propeller is 8 feet 9 inches in diameter and has a mean pitch of 15 feet. The following are the principal dimensions of the engine:

Diameter of cylinder	34.1 inches.
Stroke of piston	30 inches.
Diameter of piston-rod	4¾ inches.
Size of cylinder-ports	2⅛ by 27 inches.
Ratio of piston displacement to capacity of clearances and passages	.065

The boiler, steam-pipes, and cylinder are thoroughly covered with hair-felt and canvas, and exposed parts in engine-room have an additional covering of either Russia iron or black walnut secured by brass bands.

Steam for jackets is ordinarily conducted through a felted pipe from bottom of steam-chest to upper part of cavity in cylinder-cover. A second pipe leads from the bottom of the cavity in cover, upward and around to the side-jacket, which is in common with the jacket for bottom of cylinder. By this arrangement any water which collects in bottom of main chest or cylinder-cover is carried into the main jacket from which all water is blown into hot-well through an intermediate vessel provided with a glass gauge. A small throttle-valve on the discharge-pipe from the vessel is regulated to show a water-level in the glass at all times, thus preventing loss of steam or an undue collection of water.

The boiler was designed to carry regularly a steam-pressure of 60 pounds. At the time of the trial it was nearly new and was worked part of the time with a steam pressure of 70 pounds, to correspond with that carried during the trials of the revenue steamers *Rush* and Dexter, previously mentioned.

MANNER OF CONDUCTING THE EXPERIMENTS.

The experiments with the Gallatin were made under the general direction of the undersigned, at the United States navy-yard, Boston, Mass., in the months of December, 1874, and January, 1875, and the system adopted was similar to that used during the trials of the United States revenue steamers Rush, Dexter, and Dallas, made under the same direction in the month of August, 1874, full particulars of which may be found in the report of same, dated October, 1874. The following officers were detailed by the Navy and Treasury Departments, respectively, to take immediate charge of the experiments, viz: Chief Engineers Charles E. De Valin and Edward Farmer, United States Navy; Chief Engineers Charles A. Satterlee and Charles H. Ball, United States Revenue Marine; Passed Assistant Engineer W. D. Smith and Assistant Engineer J. A. Tobin, United States Navy; and First Assistant Engineers John T. Collins and J. A. Severns, United States Revenue Marine. Each chief engineer with an assistant stood regular watches while the experiments were in progress, and signed the original log. One of the undersigned was at all times on the vessel or within call. The computations were made by Passed Assistant Engineers Greenleaf and Brosnahan, and Assistant Engineer Gates, United States Navy, and Mr. E. Hugentobler in behalf of the United States Revenue Marine.

The experiments were made with the vessel secured to the wharf.

The coal, which was anthracite of fair quality, was broken on the wharf to proper size (the vessel's bunkers having been closed and sealed) and filled into bags to a certain weight.

The bags were sent on board when ordered by the senior engineer on watch, he making record on the log of the number of bags and the time of receipt, a similar record being made by one of the men on the wharf. At the end of the hour the number of bags of coal actually put on the fire was reported from the fire-room and entered in the appropriate column. The several records agreed with each other, and the total amount expended corresponded with the total number of bags filled on the wharf. The ashes were measured into buckets, of which the mean weight was ascertained and tallied as they were hoisted out. They were afterward weighed in gross on the wharf and the two accounts found to agree substantially.

The feed-water was measured after its delivery from the surface-condenser, and before its return to the boiler, in the tank used during the previous experiments, which was constructed of boiler-plate, and was divided, by a partition of the same material, into two equal parts. In the upper edge of the partition-plate was cut a rectangular notch 8 inches long, by which the height to which each half of the tank could be filled was determined. The mean of the weight of water which the half-tanks contained was 1,129¼ pounds at a temperature of 72 degrees Fahrenheit. In the computation of each experiment the weight of water is reduced to correspond with the mean temperature. The measuring-tank was erected on the hurricane deck just abaft engine-room skylight, and covered by a temporary cabin, in which was a small stove with which the assistant could regulate the temperature of the inclosure at will. [The previous experiments were made in the summer, and the tank was sheltered from sun and rain simply by the deck-awning.]

One of the feed-pumps was disconnected from the check feed-valve and arranged to discharge the condensed water from hot-well into a small receiving-tank supported above the measuring-tank. The receiving-tank had on its bottom two cocks, one over each half-tank, so that either could be filled from it at will.

The other feed-pump had its suction-pipe detached from the hot-well and connected with the bottoms of the two half-tanks through a cock on each, so that the contents of either could be drawn out and discharged into the boiler.

The method of measuring the water and recording it was as follows: One side having been filled, the cock over it on the receiving-tank was closed, and the other over the empty one half opened. When the water in the full one had settled to the height of the edge of the notch, its cock in the feed-pipe was opened and its contents pumped into the boiler, (care being taken to empty one in less time than it required to fill the other;) when empty its feed-cock was closed. When the water in the tank being filled reached within a few inches of the notch a gong in the engine-room was sounded to call attention, and when it reached the notch the gong was struck twice; at this instant the assistant engineer in the engine-room noted the reading of the counter, and an attendant in the fire-room noted and reported the height of water in the glass gauge on the boiler, as shown by a scale of inches secured to it. The attendant at the tank also noted the time of filling and the temperature when the tank was half emptied. After entering the number of the counter in the log, the assistant engineer ascertained the numerical difference between that and the preceding entry, and if it was far from the average its cause was sought for.

By this system of checks all errors of record could be detected, and it was possible to preserve and utilize any continuous run which came to an end through derangement of the engine. All parts of the tanks, pipes, and cocks were plainly visible to the eye, and had any leaks occurred therein they must have been detected.

The water from steam-jacket, steam-chest, &c., was measured as follows: The discharge-pipe from the drip-vessel, previously mentioned as connected with the lower part of steam-jacket, was led through the coil of an ordinary ship's distiller, the coil being kept cool by allowing circulating water from the condenser to flow through a case surrounding the same into the bilge. This formed a refrigerating apparatus, and the water from jacket, &c., being cooled thereby was permitted to flow freely into an open tank set on a scale. When the tank was full the discharge from refrigerator was temporarily shut off, and the weight of tank and water noted. The tank was emptied by suction through a pipe dipping therein and connected with the condenser. The suction-pipe was provided both with a stop and an air valve, the latter being opened when the tank was filling, to prevent any water being drawn into the condenser at that time by leakage of the former. The water being delivered into the condenser formed part of that received in the hot-well, and was therefore charged in determining the cost of the power.

The surface-condenser, boiler, and steam and water connections proved quite tight, so that the water lost in the circulation to and from the engine was very slight, and only during the longer experiments was it found necessary to add water to maintain the average level in the boiler. The small amount thus required was run from the hydrant into the tank which was at the time being filled, and was therefore measured and charged in the cost.

Indicator diagrams were taken every twenty minutes throughout the trials, and the data for the usual columns of the log immediately after filling a tank, or not less than three times an hour, in all cases. The indicator employed was one of those used during the trials of the other revenue steamers above mentioned, which again proved correct upon being tested.

The results of the experiments are shown in the first of the accompanying tables, lines 1 to 44, inclusive, containing the several observed and computed quantities upon which the performances, set forth in the remaining lines, are based.

As indicated by the general headings, a series of experiments was made at the several approximate steam-pressures of 12½, 40, and 70 pounds, both with and without steam-jacket in use, and for the higher pressure with and without vacuum. In some cases also the steam was throttled; in others the link was hauled up and the steam cut off by the lap of the main valve. The effect of using steam in the jacket of higher pressure than that in the cylinder was also tried, and the effect of draining the main steam-chest, both with and without the use of the steam jacket.

To ascertain the evaporative efficiency of the boiler, the machinery was operated continuously for 48 hours with an approximate steam-pressure of 70 pounds. During the first 24 hours of this period the steam-jacket was in use, and the run, for this time, is designated No. 38 in table. For the last 24 hours the steam was shut off the jacket and the pipes disconnected; for this time the run is designated No. 33 in table. The evaporation is calculated separately for each of these runs on the basis of the coal charged in the log for the respective times, and it will be seen in line 55 that the results correspond closely, run No. 38 showing an evaporation from observed temperature and pressure of 7.34 pounds of water, the rate of combustion per square foot of grate being 15.3 pounds per hour, while in run No. 33, with the increased rate of combustion of 16.3 pounds, the evaporation was 7.26 pounds of water. The two runs, 38 and 33, (though the records are arranged for classification under different heads,) were actually consecutive, the latter being held to commence when the steam-jacket was shut off, without any stoppage or other change of condition. The runs taken together can then, as respects evaporation, if desired, properly be calculated as one of 48 hours' duration.

In all cases when steam was shut off from the jacket a joint was broken in the jacket-connections to let in air and prevent the possibility of any leakage being undetected.

For the remaining experiments, which were each but two hours long, approximately, the water-measure alone was used to determine the cost of the power, as the coal could not be distributed accurately for such short intervals.

By adopting a duration of two hours for a majority of the experiments it became possible to obtain far more information in the limited time than in any other manner, and it is believed that the result can be depended upon fully as well as if the experiments were each of 48 to 96 hours' duration and fewer in number. In determining the variation due to changes of condition, it is important that all conditions remain uniform during each experiment, which is practicable for short but not for long runs. It may be claimed that a mistake in an observation will affect a long run less than a short one, but the fact seems to be that any important error will, for a short run, give such a wide difference of result, compared with other runs, as to indicate the probability of a mistake at once. We acknowledge that a single short run may be of little value; but by making a series of short runs, in which but one condition is changed slightly for each experiment, the results of the several experiments may be compared together, (by plotting the same in a curve, for instance,) when a general correspondence will usually be observed, which will enable errors in observation or calculation to be detected, and insure a degree of accuracy generally impracticable for a long run, where an error affects

e final result only and may never be discovered. It will often occur, however, that the verage cost of the power will be less for short runs than for long ones; the short runs ving the accurate maximum results due to uniform conditions, which form the true basis or scientific comparison, while for long runs the results, at the best, can only be averages of maximum and inferior results. The maximum can be obtained permanently by keeping the conditions uniform—for instance, the economy due to a high steam-pressure is obtained on land by using large boilers and automatic regulating devices. The short runs may then, in general, be considered as showing what is *possible* with *proper* apparatus; the long ones what is *possible* continuously with the *particular* apparatus tested.

In working out the experiments a number were found not to correspond with others of the same series, and in a few of them errors of observation or faults with the indicator-diagrams were discovered which necessitated their rejection. Those in which no errors could be detected have been retained, as we have not felt authorized to reject any without cause, though most of the discrepant ones were made during the first few days, before the entire force had become thoroughly acquainted with the duties. In two experiments, Nos. 10 and 12, the atmospheric line was misplaced on the diagrams, but, the latter being otherwise perfect, the misplacement was corrected by comparison with other diagrams. The most important difficulty with the diagrams was, however, caused by the sticking of the indicator-piston from the action of the lubricants in main cylinder. The difficulty was known and provided for by regular periods of cleaning the indicator, but it appears that the precaution was neglected occasionally, particularly by one assistant, till the distortion of diagrams could be seen by the eye without using the scale. The experiments with faulty diagrams were rejected except seven of the short ones, in which the action had only progressed sufficiently to change the position of the vacuum line. These experiments, which are numbered, respectively, 13, 30, 34, 37, 40, 41, and 42, and distinguished by an asterisk in tables, have been carefully corrected by comparing the diagrams and the records of vacuum thereon with others taken under similar conditions.

We feel assured that many of the contradictory results of experiments heretofore published have been due to mistakes in observation or faults in the working of instruments, which were either undiscovered or neglected, and have therefore felt it our duty to state fully what occurred during these experiments, notwithstanding the interest manifested by the officers engaged, the system of checks and counter-checks, and, in general, the extraordinary care taken to insure accuracy.

It is evident, however, that the character of the results are sufficiently indicated by the thirty-six experiments about which there is no question. The seven others referred to have been corrected, we think, on an accurate basis, and retained for what they are worth, simply to preserve the symmetry of the series of runs.

To determine what may be called the quality of the steam—in other words, to ascertain whether it was moist, saturated, or superheated, and in what degree moist or superheated—a calorimeter was erected in the gangway abreast of engine-room, consisting of a large tight barrel set on a platform-scale, with a screw-propeller mounted inside and near the bottom of the barrel on a vertical shaft, terminating at the top with a crank. In the barrel was hung a large thermometer. To the bottom of the throttle-valve chest, on side of main steam-chest of engine, a connection one inch in diameter was made, the pipe running up inside to the height of one of the ports admitting steam to main chest, which pipe connected through a valve to a short piece of hose, which was warmed by blowing steam through the same just previous to an experiment. The barrel being filled with water, its weight and temperature were accurately ascertained, and the hose, with steam at the time escaping therefrom, quickly thrust into the water, the steam turned on more fully, and the propeller revolved. With the latter a decided circulation could be easily obtained, which immediately equalized the temperature. When the temperature had been to the degree desired the steam was partially shut off, the hose removed, and a final observation of weight and temperature immediately taken.

These experiments were made on different days with different steam-pressures, and at different intervals in relation to the time when fires were cleaned. The results of the trial are shown in the following table in connection with the data from which they were calculated. The steam-pressures are those in the boiler, and as the steam-pipe was large and short, it is believed that there was no considerable reduction of pressure in the throttle-valve chest. The metal propeller and shaft being immersed in the water, were subject to the same changes of temperature, and for simplicity their influence on the result was estimated on the basis of their specific heats and ascertained to be equal to that of one and one-half pounds of water, which quantity has been added in each case to the actual amount of water in calorimeter. The quantities in column 8 showing the percentage of moisture in the steam are negative for experiments in which the steam was superheated, that form of expression being used for convenience in determining the averages for the several approximate pressures.

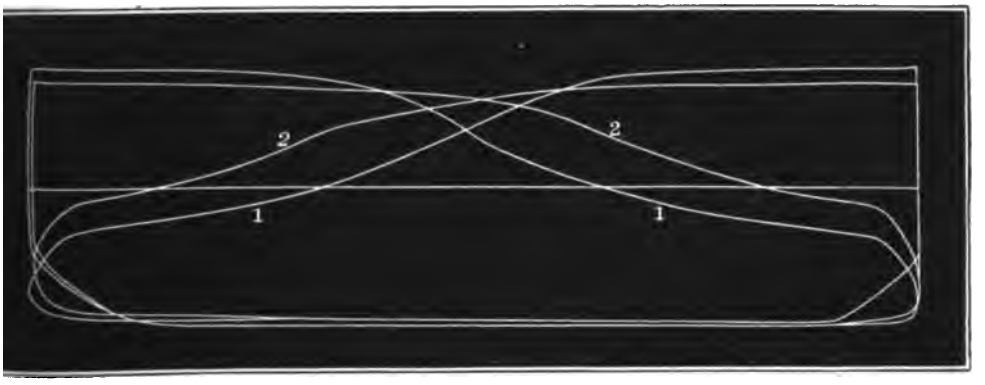
INDICATOR DIAGRAMS

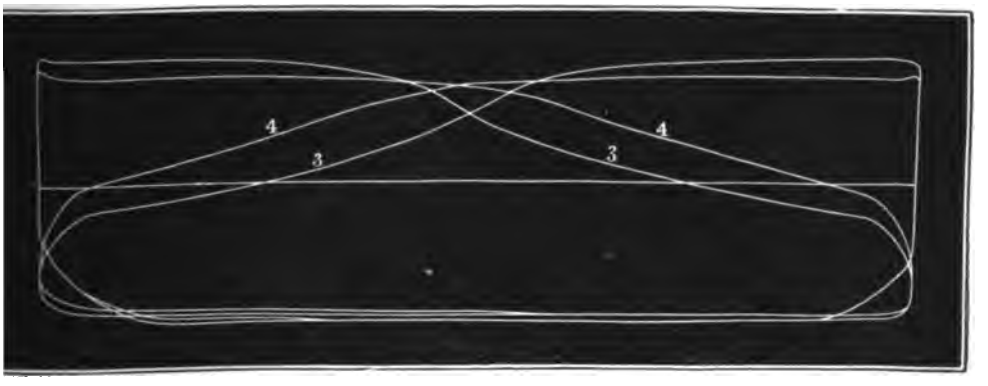
To accompany report of Experiments made with the Steam Machinery of the U. S. Revenue Steamer *Gallatin*, under the general direction of Chief Eng'r Chas. H. Loring, U. S. N., and Chas. E. Emery, Consulting Eng'r, U. S. R. M.

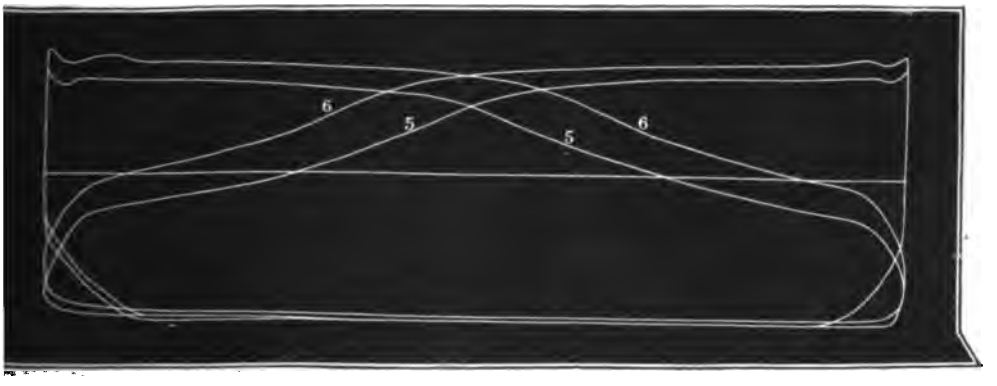
U. S. REVENUE STEAMER GALLATIN.

The numbers on diagrams refer to the numbers of experiments as written in first table, and in Series II of Summary.

Scale of Indicator, 16 pounds per inch.

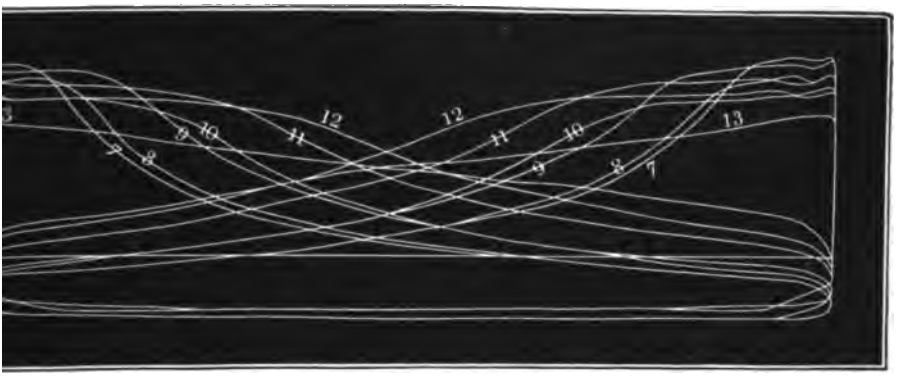


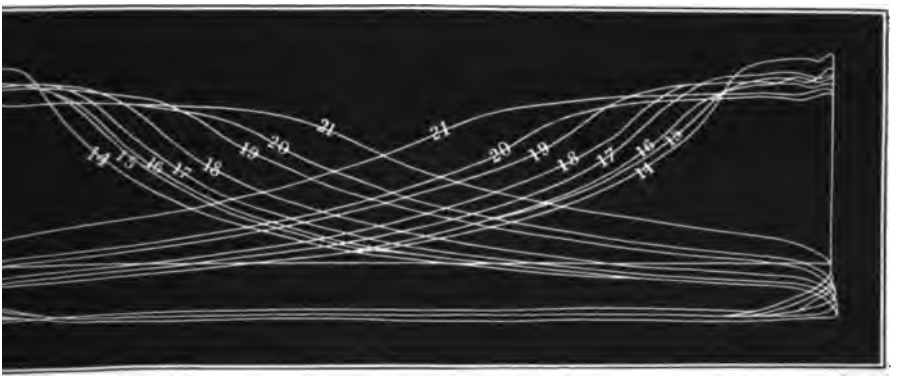


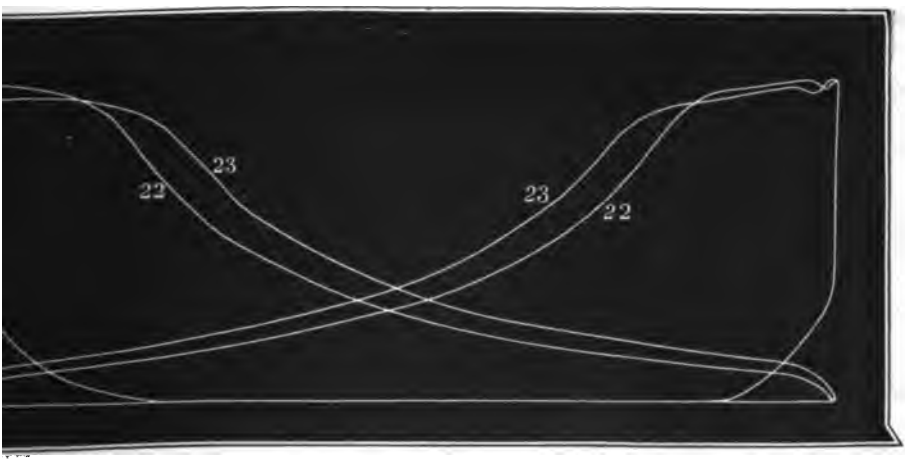


INDICATOR DIAGRAMS.

Scale of Indicator, 40 pounds per inch.

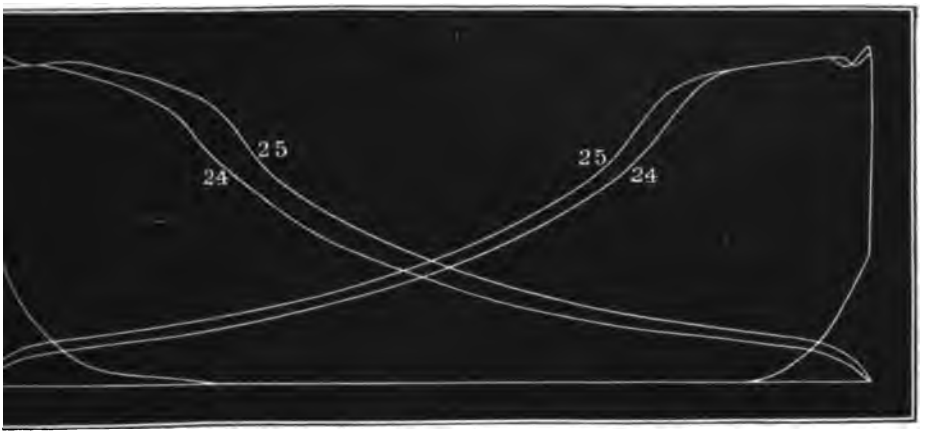


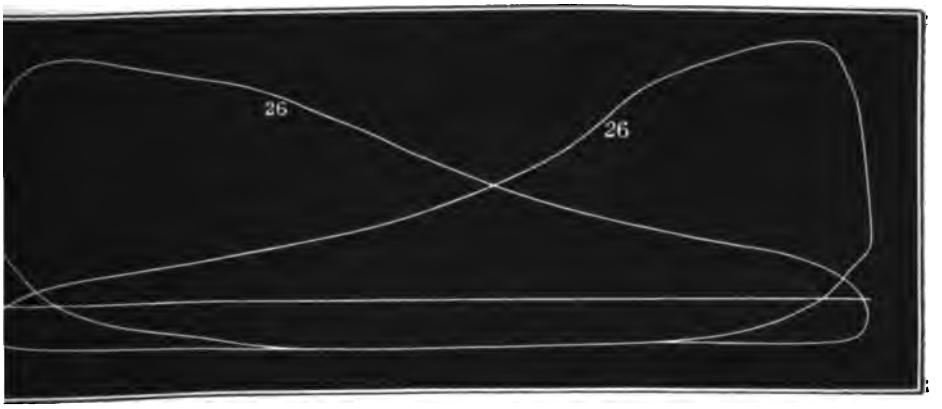


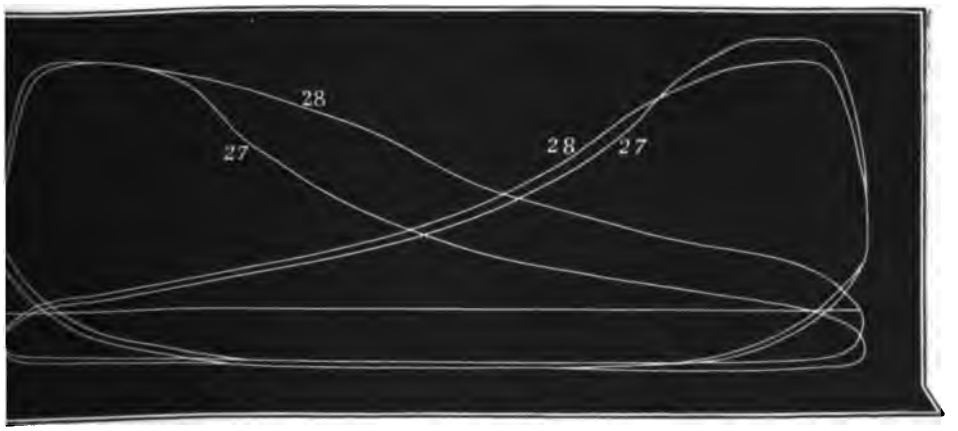


INDICATOR DIAGRAMS.

Scale of Indicator, 40 pounds per inch.

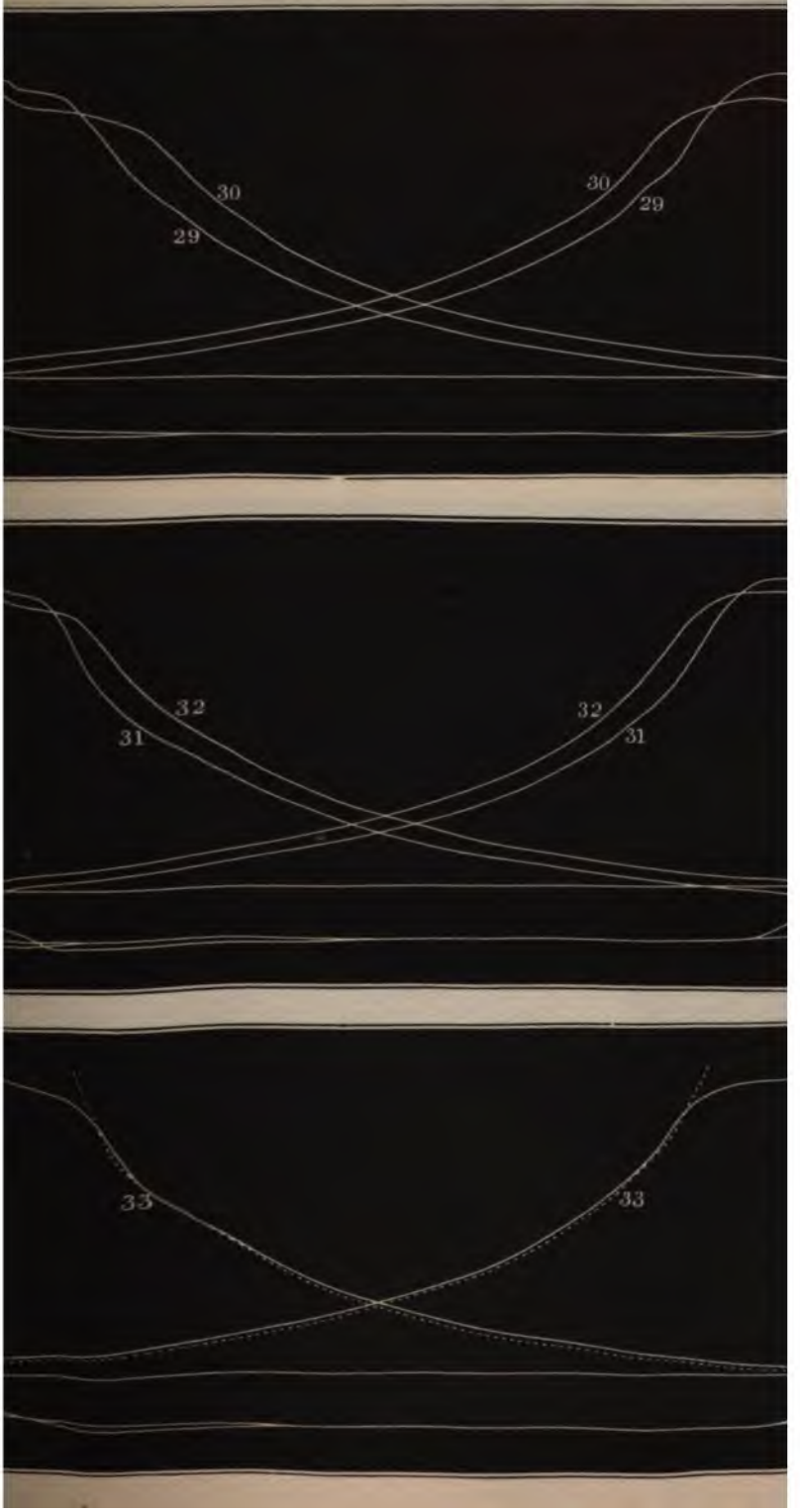






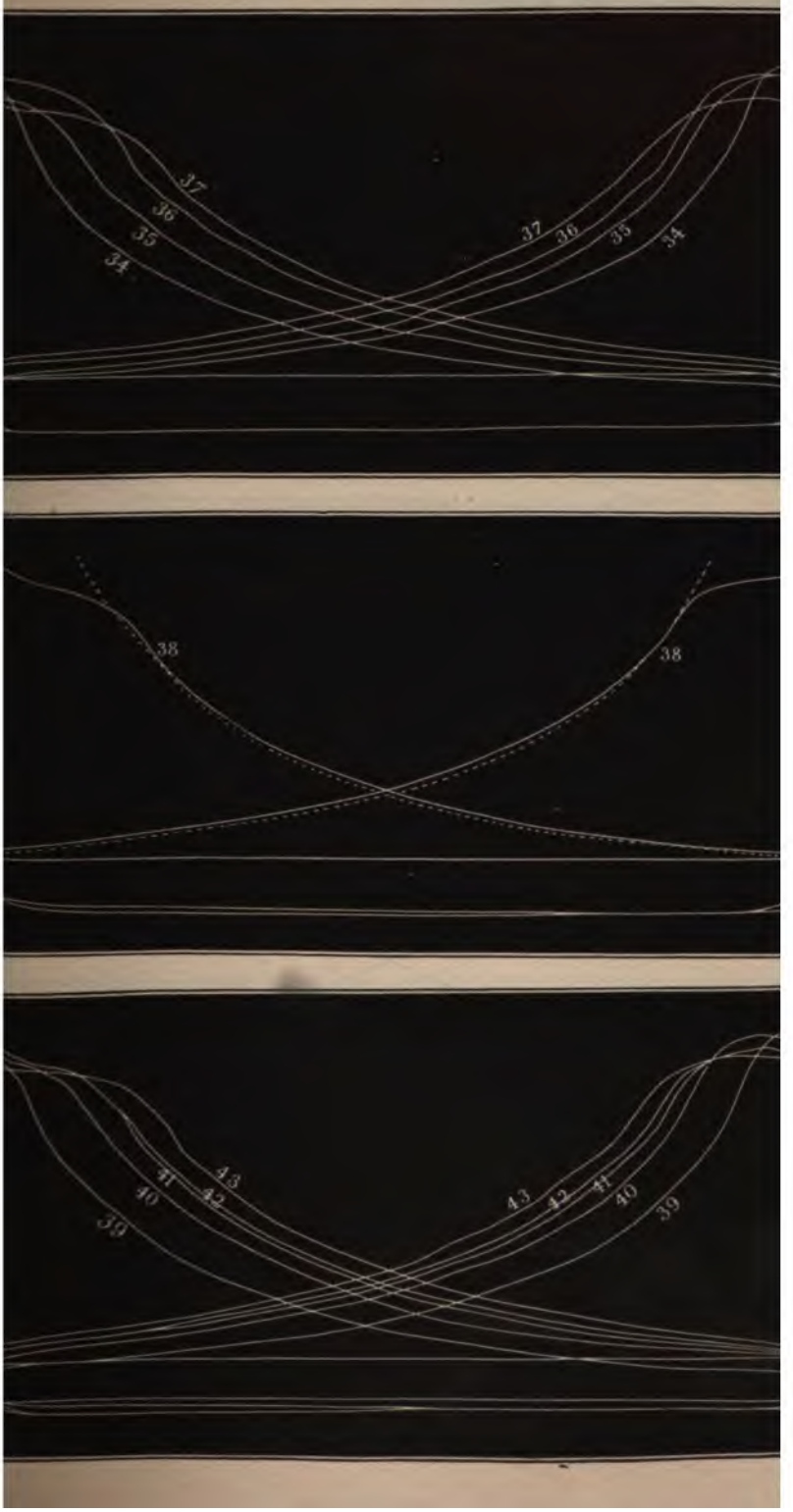
INDICATOR DIAGRAMS.

Scale of Indicator, 40 pounds per inch.



INDICATOR DIAGRAMS.

Scale of Indicator, 40 pounds per inch.



INDICATOR DIAGRAMS.

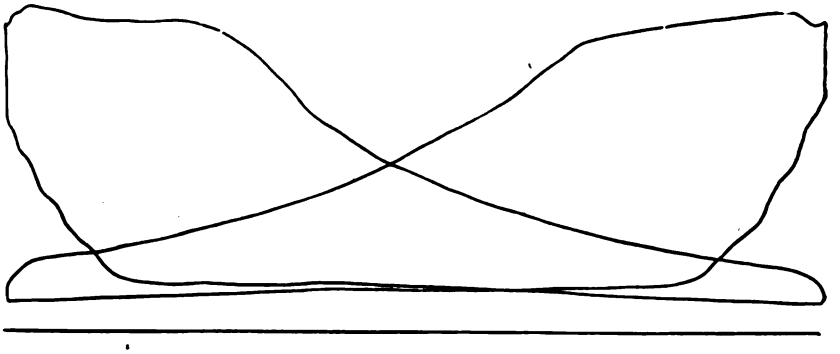
From Report of August, 1874.

U. S. REVENUE STEAMER RUSH.

Summary: Series I, Exp. 1.

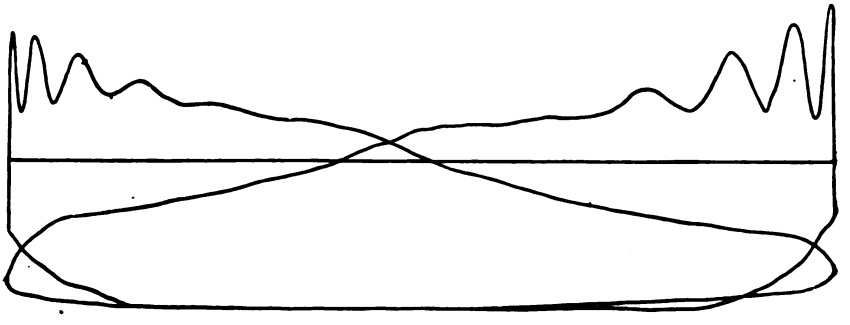
HIGH-PRESSURE CYLINDER.

Scale of Indicator, 40 pounds per inch.



LOW-PRESSURE CYLINDER.

Scale of Indicator, 16 pounds per inch.



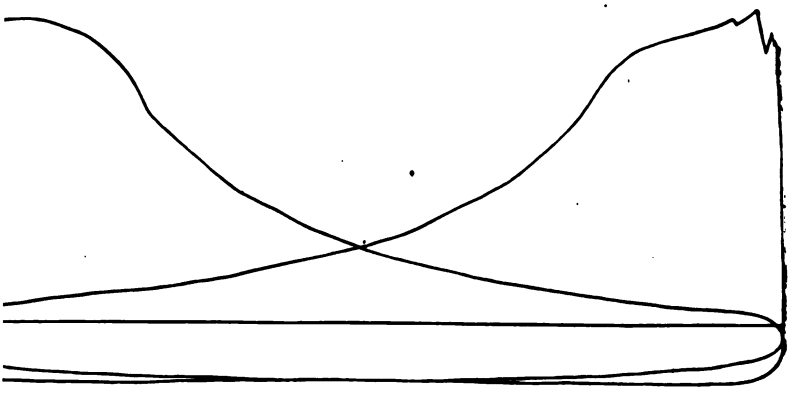
INDICATOR DIAGRAMS.

From Report of August, 1874.

U. S. REVENUE STEAMER DEXTER.

Summary: Series I, Exp. 5.

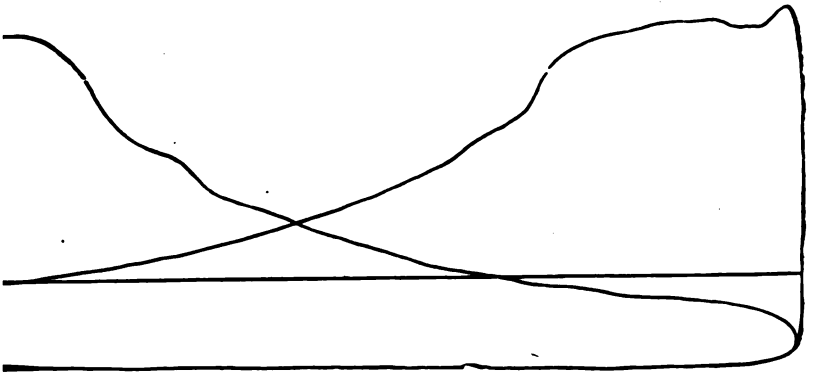
Scale of Indicator, 40 pounds per inch.



U. S. REVENUE STEAMER DALLAS.

Summary: Series I, Exp. 12.

Scale of Indicator, 24 pounds per inch.



No. 10.

BUREAU OF CONSTRUCTION AND REPAIR.

NAVY DEPARTMENT,
BUREAU OF CONSTRUCTION AND REPAIR,
November 17, 1875.

: I have the honor to inclose the estimated amount required for ınual expenditures coming under the cognizance of the Bureau struction and Repair, and also a list of vessels repaired, with the ıtatement of contracts made, in compliance with your instructions. estimated amount required for construction and repair for the ·ear ending the 30th of June, 1877, exceeds the yearly appropria- ıade for a few years past, for that purpose, by $600,000, and, in ation, I beg leave to say that it will require all the amount rec- ıded to keep those vessels that are worthy of being retained in ıvy in proper condition for sea-service.

ı well known that wooden vessels will rapidly deteriorate, and more rapidly since steam has become the principal motive-power. 'avy has been changed entirely within the last twenty years, as s fighting-vessels, from sail to steam power; consequently nearly quite double the expenditure is required to keep the same num- vessels in good condition.

854 there were five steam-frigates, and one rebuilding; three heel vessels, and one propeller of the fourth class; and four small ·rs, and a tender; fifteen steam-vessels, and forty-eight sailing- ı, classed from a line-of-battle ship down to a schooner, and which ıuted the whole force of the United States Navy. At the pres- me we have seventy wooden and three iron steam cruising- ı, twenty-three small iron and wooden steamers, with forty steam- es.

854 the appropriation for increase and repair was $2,534,950, and ·4 was $3,300,000. In 1854 we had forty-eight sailing-vessels and ·n steamers; and in 1874 we had one hundred and fifty-eight steam- rge and small, besides twenty-six sailing-vessels. It is necessary ·ing a comparison of the costs of repairs in 1854 and in 1874 to also the difference in mechanics' wages and the number of work- ırs. The wages paid mechanics in the former year averaged $1.95 per day of ten hours; in 1874, the average was $2.87 per eight hours. It will readily be seen, from the facts above stated, ; will be impossible to keep the Navy in good condition for less he amount asked for.

ıe year 1871 there were fifty-two iron-clads upon the Naval Reg- ɔf these, three only were in proper condition for service. Twenty- ·re light-draught monitors, insufficient in displacement to carry ıce or stores, and entirely worthless as war-vessels—built by s from an inexperienced amateur, in violation of well-known prin- of naval architecture, and at a loss to the Government of many ıs of dollars. Other nations have lost money in the same way, et we find, every day, men with a limited knowledge of naval ·cture, and without any practical experience, aided by some ıtsman of limited capacity and knowledge, bringing forward s of vessels upon principles long since discarded, and, while ing to the examination of their designs by those competent to of their merits, are strenuously urging their adoption by the nment.

Four of the iron-clads of the largest dimensions were on the stocks built of unseasoned white-oak timber, about one-half completed, and partially decayed. Three were river-vessels of small dimensions, and of no use as fighting-vessels for harbor defense. Six, lying at New Orleans, were condemned, not considered worth the cost of repairing. Fourteen of the best were constructed of iron hulls, but had wooden beams and decks, which were quite rotten, and wanting an addition to free board. Of the whole number, only twenty-one were found to be worth repairing, and fourteen of these, before they could be sent to sea, required new decks of iron, to be raised up, and extensive repairs to be made to the machinery and boilers. Fourteen of the number above stated have been thoroughly and carefully repaired and improved, so that at the present time they are in excellent condition and ready for sea. Four of the twenty-one (the Monadnock and three others of larger class) were built of white-oak timber, and were the most powerful of all the vessels in the Navy, but they had become very rotten and unserviceable. Iron frames for these vessels have been substituted for wood, and the plating of iron is nearly completed. The work upon these four iron-clads is well advanced, and, if the funds were available, they could be completed in a few months.

Plans for the alteration and repair of the Puritan have been prepared by the Bureau, and her repairs have been commenced.

Extensive repairs will soon be required upon the Dictator, and the Roanoke will require to be rebuilt.

It will be seen that at no time has the Navy been in such good and strong condition for harbor and coast defense as at the present time.

The power of our iron-clads for harbor and coast defense, where the fighting will be done in smooth water, must be considered equal, if not superior, to that of a large number of sea-going iron-clads of foreign nations. No type of vessel, if we except the Russian casemated circular iron-clad, has yet been designed which presents the same amount of resistance on the like draught of water as that of the monitor type. Their decks are near the water, which forms an impregnable resistance, and the turret, constructed to offer the largest amount of resistance in proportion to the amount of weight of material, presents the smallest target for the enemy's shot. No officer in command of one of our monitors would hesitate to engage in action, in smooth water, any sea-going iron-clad vessel yet afloat, except, perhaps, a few of the latest type.

Since the year 1871, three of our very serviceable vessels, the Oneida, Saginaw, and Saranac, have been lost at sea, and twelve of our largest men-of-war have been broken up and sold. Two sailing-vessels have been repaired and turned over to the State authorities for school-ships, and six have been condemned and pronounced unworthy of repairs. Thus it will be seen that twenty-three cruising-vessels have gone out of the Navy since that time, and eight, mostly small vessels, have been constructed and added, leaving the Navy thirteen vessels short of the number at that time, or during the four years past. There are still others in commission which are deteriorated in such parts as will require too extensive repairs at the end of their present cruise to be of any further use to the service.

The usual appropriations are barely sufficient to keep those vessels worthy of repairs in good condition, and hence, to keep the present number in the Navy, additional appropriations must be made for the building of new vessels. The building of at least four new vessels is earnestly recommended, and is demanded by every reason that would require the Government to have a navy; justice to our nation, and our

obligations to the civilized and christianized people of the world, call for it.

The science of naval architecture is steadily and constantly being more fully developed, and bringing into action greater power in the different elements which enter into the design of an efficient man-of-war, and requiring new mechanical inventions for their practical operation. Ordnance, steam-power, and the use of the torpedo are being changed and improved every day, all requiring new designs of vessels for development, and demanding of the naval architect careful and constant study; and the new designs embracing these improvements must be practically tested by the construction of new war-vessels to prove their value. No maritime nation can maintain a respectable position as a naval power without a yearly increase of naval vessels with modern improvements. It is only by the annual construction of vessels of war that the United States can command respect abroad, and maintain her well-known reputation of being the originator of the finest forms of naval vessels, and a type for other nations to copy.

By your direction, a board of naval constructors have visited the principal navy-yards on the Atlantic coast, and their report is herewith respectfully submitted. From their report it will be seen that there is on hand at the several yards, with the addition of about 200,000 cubic feet of live-oak timber, enough to build thirty-five vessels of war of medium size. Other kinds of timber and lumber are required, which should be purchased and carefully stored, that it may become properly seasoned before it is used in the construction of new vessels.

The Government, to be prepared for any emergency which may arise, must have on hand enough of well-seasoned timber to build seventy-five vessels at least, with dispatch, all of which could be built in six months if the materials were ready. The loss to the Government of many millions of dollars, by the building of vessels of unseasoned timber during the late war, is a sufficient reason why our navy-yards should be well supplied with seasoned material.

I beg leave to call your attention to the cost of labor in the United States, England, Germany, and France, which will explain the difference in maintaining a navy in the several governments. In the United States, the average wages paid to mechanics at the several yards for the past five years has been $2.87 per day of eight hours; in England, the average has been $1.23 for nine hours; in Germany $1.09 for eleven hours; in France, 70 cents for twelve hours' work. The cost of materials used in building war-vessels in England, Germany, and France has not been over four-fifths of the cost of the same articles in the United States. It will be seen from the above that the cost of building ships of war in the United States must necessarily be double that in either of the countries above named; and if our Government should adopt the policy of England, of building 20,000 tons of war-vessels every year, at a cost of $10,000,000, an appropriation of at least $20,000,000, in addition to the amount required for the repairs and general maintenance of the Navy, would have to be made.

A tabular statement of the comparative power and qualities of the cruising-vessels of the United States with those of other nations is herewith submitted.

I have the honor to be, very respectfully, your obedient servant,

I. HANSCOM,
Chief of Bureau.

Hon. GEO. M. ROBESON,
Secretary of the Navy.

Estimates of appropriations required for the service of the fiscal year ending June 30, 187[illegible] by the Bureau of Construction and Repair.

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the current fiscal year ending June 30, 187[illegible]
SALARIES.		
Chief clerk, per act of July 5, 1862, (12 Stat. at L., p. 511, sec. 3)	$1,800 00	
Draughtsman, per act of March 2, 1867, (14 Stat. at L., p. 450, sec. 1)	1,800 00	
One clerk of class four, per act of July 23, 1866, (14 Stat. at L., p. 207, sec. 8)	1,800 00	
Two clerks of class three, per act of July 23, 1866, (14 Stat. at L., p. 207, sec. 8)	3,200 00	
Two clerks of class two, per act of July 23, 1866, (14 Stat. at L., p. 207, sec. 8)	2,800 00	
One messenger, per act of July 5, 1862, (12 Stat. at L., p. 511, sec. 3,) and March 3, 1869, (15 Stat at L., p. 287, sec. 1.)	840 00	
One laborer, per act of July 5, 1862, (12 Stat. at L., p. 511, sec. 3,) and March 3, 1869, (15 Stat at L., p. 287, sec. 1.)	720 00	
	12,960 00	$12,960 00
CONTINGENT.		
Stationery and miscellaneous items, (appropriated, 18 Stat. at L., p. 363)	800 00	800 00
CONSTRUCTION AND REPAIR OF VESSELS.		
Preservation of vessels on the stocks and in ordinary; purchase of materials and stores of all kinds; labor in navy-yards and on foreign stations; preservation of material; purchase of tools; wear, tear, and repair of vessels afloat, and general maintenance of the Navy; incidental expenses, advertising, and foreign postages, (appropriated, 18 Stat. at L., p. 300.)	3,300,000 00	3,300,000 00
PROTECTION OF TIMBER-LANDS.		
Salaries of sub-agents and watchmen, and miscellaneous expenses, (appropriated, 18 Stat. at L., p. 300.)	5,000 00	5,000 00

I. HANSCOM,
Chief of Bureau.

ired and built under the cognizance of the Bureau of Construction and Repair.

Glance.	California.
Mayflower.	Camanche.
Nantucket.	Independence.
Napa.	Iroquois.
Nebraska.	Jamestown.
Passaic.	Lackawanna.
Pilgrim.	Mohican.
Potomac.	Monterey.
Quinnebaug.	Narragansett.
Ranger.	Nyack.
St. Louis.	Pensacola.
Alarm.	Portsmouth.
Catskill.	Saranac.
Despatch.	Tuscarora.
Fortune.	Ajax.
Gettysburg.	Canandaigua.
Hero.	Despatch.
Nipsic.	Kansas.
Piscataqua.	Mahopac.
Relief.	Manhattan.
Rescue.	Ossipee.
Triana.	Rose.
Wyoming.	Saugus.
Brooklyn.	Canonicus.
Canandaigua.	Wyandotte.
Constellation.	Nahant.
Dictator.	Jason.
Fortune.	Passaic.
Frolic.	Lehigh.
Huron.	Nantucket.
Jean Sands.	Catskill.
New Hampshire.	Montauk.
Ossipee.	Amphitrite.
Powhatan.	Miantonomah.
Shawmut.	Terror.
Snowdrop.	Puritan.
Worcester.	Monadnock.
Benicia.	

CONSTRUCTION AND REPAIR,
er 17, 1875.

se names appear m re than once have been repaire d at different navy-

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terials to the amount on hand to build the number of vessels set against each yard.

ards.	Live oak, curved and frame.	Yellow-pine plank-stocks.	White-oak keel-pieces.	White-oak knees.	White-pine board and plank.	White ash.	Black-walnut board and plank.	Lignum-vitæ.	Cypress.
	Cub. ft.	*Cub. ft.*	*Cub. ft.*		*Ft. b. m.*	*Ft. b. m.*	*Ft. b. m.*	*Lbs.*	*Ft. b. m.*
, N. H...	32, 000	60, 000	3, 000	3, 200	268, 000	3, 200	7, 000	.....	.....
s ...., ..	99, 000	174, 500	... .	8, 000	949, 000	140, 000	270, 000	493, 000	.....
N. Y	32, 000	50, 000	5, 000	4, 800	268, 000	120, 000	20, 000	.....	25, 000
.....	32, 000	93, 000	3, 700	3, 680	495, 000	80, 000	20, 000	.....	11, 000
, D. C...	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fla	.....	.....	.....	.....	.....	.....	.....	.....	.....
l, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	195, 000	377, 500	11, 700	19, 680	1, 980, 000	343, 200	317, 000	493, 000	36, 000

Relative comparison of the iron-clad vessels of the English and United States navies.

ENGLISH IRON-CLADS.					UNITED STATES IRON-CLADS.		
Name of vessel.	Guns.	Tonnage.	Length.	Breadth.	Name of vessel.	Guns.	Tonnage.
Abyssinia	4	1,854	.....	...			
Achilles	26	6,121	380	58			
Agincourt	28	6,621	400	59	Monadnock	4	1,09[illegible]91
Audacious	14	3,774	280	54			
Bellerophon	15	4,270	380	58	Amphitrite	4	87[illegible]74
Black Prince	28	6,109	380	58			
Caledonia	24	4,125	273	58	Montauk	2	49[illegible]6
Cerberus	4	2,107	.....	...	Colossus	10	2,12[illegible]7
Cyclops	4	2,107	.....	...	Massachusetts	4	2,12[illegible]7
Defense	16	3,720	280	54			
Devastation	4	4,406	248	58	Puritan	2	1,87[illegible]0
Enterprise	4	993	180	36			
Erebus	16	1,954	.....	...	Ajax	2	55[illegible]0
Favorite	10	2,094	225	47	Canonicus	2	55[illegible]0
Fury	4	5,030	282	58	Camanche	2	49[illegible]6
Glatton	2	2,709	212	49	Catskill	2	49[illegible]6
Gorgon	4	2,107	.....	...	Nebraska	4	2,12[illegible]5
Hecate	4	2,107	.....	...	Oregon	4	2,12[illegible]5
Hector	18	4,089	280	56			
Hercules	14	5,234	325	59			
Hotspur	3	2,637	200	50	Jason	2	49[illegible]6
Hydra	4	2,107	.....	...	Lehigh	2	49[illegible]6
Invincible	14	3,774	280	54	Mahopac	2	55[illegible]0
Iron Duke	14	3,787	244	54	Manhattan	2	55[illegible]0
Lord Clyde	18	4,067	280	59	Saugus	2	55[illegible]0
Lord Warden	18	4,080	280	59	Wyandotte	.....	.....
Magdala	4	2,107	.....	...			
Minotau	26	6,621	400	59	Miantonomoh	4	1,2[illegible]5
Monarch	7	5,102	330	57	Terror	4	1,0[illegible]5
Northumberland	28	6,621	400	59	Dictator	2	1,7[illegible]0
Ocean	24	4,047	280	58	Nantucket	2	4[illegible]6
Pallas	8	2,372	225	50	Roanoke	6	2,2[illegible]0
Penelope	11	3,096	260	50			
Prince Albert	4	2,537	240	48	Dictator	2	1,[illegible]0
Prince Consort	24	4,045	280	58	Nahant	2	[illegible]6
Repulse	12	3,749	215	58			
Research	4	1,253	195	38			
Resistance	16	3,710	280	54			
Royal Alfred	18	4,068	280	58	Shawnee	2	[illegible]3
Royal Oak	24	4,056	273	58	Wassuc	1	[illegible]3
Royal Sovereign	5	3,765	240	62			
Rupert	4	3,159	250	53			
Scorpion	4	1,833	220	42			
Sultan	12	5,234	282	59			
Swiftsure	14	3,893	242	55			
Terror	16	1,971	.....	...			
Thunder	14	1,469	.....	...			
Thunderbolt	16	1,973	.....	...			
Thunderer	4	4,406	285	58			
Triumph	14	3,893	242	55			
Valiant	18	4,063	280	56			
Vanguard	14	3,774	244	54			
Viper	4	737	225	50			
Vixen	4	745	225	50			
Warrior	32	1,270	380	58			
Waterwitch	4	777	225	50			
Wivern	4	1,899	220	42			
Zealous	20	3,716	280	54			

arison of the number of guns and tonnage of the English and the United States naval vessels.

D STATES NAVAL VESSELS.			ENGLISH NAVAL VESSELS.		
ne of vessel.	Guns.	Tonnage.	Name of vessel.	Guns.	Tonnage.
	46	3,032	Phæton	28	3,099
	39	3,173	Endymion	23	3,197
	46	3,000	Implacable	16	3,223
	12	2,958	Pembroke	25	2,842
	45	3,000	Active	10	3,078
	21	2,869	Pembroke	25	2,842
	12	2,135	Scout	17	2,187
	23	2,135	Pearl	17	2,187
	21	2,490	Rattlesnake	17	2,431
	21	2,490	Jason	17	2,431
	22	2,120	Thalia	6	2,216
	20	2,000	Amethyst	14	1,890
	22	2,000	Modeste	14	1,934
	18	2,000	Pylades	17	2,021
	14	2,000	Victoria and Albert	2	2,000
	11	2,300	Challenger	4	2,306
	17	2,182	Charybdis	17	2,187
	12	1,122	Wild Swan	6	1,124
	12	1,122	Sphynx	5	1,061
	12	1,122	Spiteful	6	1,054
	12	1,122	Valorous	6	1,257
	10	1,036	Fawn	5	1,045
	11	1,019	Sphynx	5	1,061
	10	955	Helicon	2	945
	11	960	Rosario	3	913
	11	929	Rapid	3	913
	8	828	Sappho	4	894
	8	828	Salamis	2	835
	8	910	Peterel	3	913
	8	910	Lively	2	940
	8	910	Helicon	2	945
	8	910	Columbine	3	913
	8	910	Buzzard	2	980
	6	695	Lyra	7	675
	6	695	Frolic	4	592
	6	650	Kestrel	4	592
	6	650	Ready	4	592
	6	650	Rifleman	4	592
	6	650	Arab	3	620
	4	450	Seaflower	8	454
	4	450	Martin	10	489
	4	450	Porcupine	3	490
	6	695	Bittern	3	774
	8	671	Curlew	3	774
	6	726	Magpie	3	774
	6	726	Plover	3	774
	5	566	Midge	4	584
	3	410	Squirrel	10	447
	3	410	Ariel	4	408
	3	410	Coquette	4	408
	3	410	Foam	4	408
	3	410	Mosquito	4	408
	3	410	Merlin	4	408
	8	450	Pioneer	6	499
	8	614	Ready	4	599
	2	518	Nimble	5	570
	2	650	Speedwell	5	570
	1	365	Cockatrice	....	330
	6	306	Vivid	...	323
	4	730	Woodlark	3	774

Offers to furnish material for the Navy under the advertisement of the Bureau of Construction and Repair, of April 28, 1875, at the navy-yard, Portsmouth, N. H.

Class. Live-oak:

William White & Son	$87,100 00
Elisha H. Jewett	88,800 00
Samuel P. Brown	90,500 00
James Bigler & Co	90,300 00
John Trickey	86,500 00
Southard & Co	*67,250 00
W. C. N. Swift	90,300 00
S. C. Carll & Co	88,000 00

Class No. 4. White-oak plank:

Joseph L. Savage	5,920 00
A. Ammerman	6,700 00
William M. Shakespear	7,400 00
A. A. McCullough	6,750 00
J. B. McPherson	9,000 00
Elisha H. Jewett	*5,850 00
R. H. Hawley	6,000 00
S. P. Brown	9,500 00
Austin P. Brown	7,900 00
Southard & Co	6,628 00
S. C. Carll & Co	6,150 00

Class No. 16. White-ash oars:

Joseph L. Savage	149 60
David Babcock & Co	150 62
George T. Vaughan	143 17
W. F. Hyatt	135 17
Austin P. Brown	146 14
De Grauw, Aymar & Co	*128 34

Class No. 34. Iron plate:

Joseph L. Savage	315 00
George H. Creed	338 00
Wilson & Magraw	298 75
W. F. Hyatt	*263 75
Austin P. Brown	320 00

Class No. 35. Steel:†

Joseph L. Savage	161 00
George H. Creed	230 00
Wilson & Magraw	189 00
W. F. Hyatt	177 00
Austin P. Brown	186 00
Walton Bros	174 00
George Dunbar & Co	228 00

Class No. 42. Lead:†

Joseph L. Savage	1,290 00
George H. Creed	1,059 00
David Babcock & Co	1,080 00
Gayle & Co	1,080 00
Wilson & Magraw	1,198 80
W. F. Hyatt	1,020 00
Austin P. Brown	990 00
Walton Bros	1,050 00
George Dunbar & Co	1,140 00

Class No. 43. Zinc:

Joseph L. Savage	1,650 00
George H. Creed	1,672 00
David Babcock & Co	$1,760 0[illegible]
Gayle & Co	1,815 0[illegible]
Wilson & Magraw	2,172 5[illegible]
W. F. Hyatt	*1,628 0[illegible]
Austin P. Brown	1,639 0[illegible]
Walton Bros	1,677 5[illegible]
S. C. Carll & Co	1,980 0[illegible]

Class 44. Tin:

Joseph L. Savage	1,928 0[illegible]
George H. Creed	2,484 0[illegible]
David Babcock & Co	2,136 0[illegible]
Gayle & Co	2,018 0[illegible]
Wilson & Magraw	2,100 0[illegible]
W. F. Hyatt	1,904 6[illegible]
Austin P. Brown	2,028 0[illegible]
Walton Bros	*1,768 0[illegible]
S. C. Carll & Co	2,200 [illegible]

Class No. 51. Augers:

Joseph L. Savage	504 [illegible]
George H. Creed	400 [illegible]
David Babcock & Co	407 [illegible]
Wilson & Magraw	422 [illegible]
W. F. Hyatt	*356 [illegible]
Austin P. Brown	482 [illegible]
George Dunbar & Co	‡237 [illegible]

Class No. 53. Tools for yard use:

Joseph L. Savage	3,109 5[illegible]
George H. Creed	2,997 5[illegible]
Wilson & Magraw	3,985 5[illegible]
W. F. Hyatt	*2,982 3[illegible]
Austin P. Brown	4,077 6[illegible]

Class No. 54. Hardware:†

Joseph L. Savage	193[illegible] 0[illegible]
George H. Creed	252[illegible] 0[illegible]
David Babcock & Co	236[illegible] 6[illegible]
Wilson & Magraw	267[illegible] 4[illegible]
W. F. Hyatt	199[illegible] 5[illegible]
A. P. Brown	161 2[illegible]
S. C. Carll & Co	292[illegible] [illegible]

Class No. 56. White lead:†

Joseph L. Savage	1,100[illegible] 0[illegible]
George H. Creed	950[illegible] 0[illegible]
Gayle & Co	1,000[illegible] 0[illegible]
Wilson & Magraw	1,000[illegible] 0[illegible]
W. F. Hyatt	950[illegible] 0[illegible]
A. P. Brown	920[illegible] 0[illegible]
Walton Bros	950[illegible] 0[illegible]
Harrison Bros. & Co	997[illegible] 0[illegible]
S. C. Carll & Co	1,100[illegible] 0[illegible]
George Dunbar & Co	1,000[illegible]

Class No. 57. Zinc-paint:

Joseph L. Savage	100[illegible] 0[illegible]
George H. Creed	80[illegible] 0[illegible]
Gayle & Co	8[illegible]

*Accepted. † Class not awarded. ‡ Received too late.

Wilson & Magraw	$80 00
W. F. Hyatt	85 00
Austin P. Brown	70 00
Walton Bros	*62 50
Harrison Bros. & Co	79 30

Class No. 58. Colored paints, driers:

George H. Creed	66 40
Gayle & Co	64 60
Wilson & Magraw	67 90
W. F. Hyatt	63 40
Austin P. Brown	81 00
Walton Bros	69 30
Harrison Bros. & Co	*59 90

Class No. 59. Linseed-oil:

Joseph L. Savage	1,065 00
George H. Creed	1,027 50
David Babcock & Co	1,035 00
Gayle & Co	1,050 00
Wilson & Magraw	1,140 00
J. W. Buker	1,050 00
W. F. Hyatt	*1,020 00
A. P. Brown	1,155 00
Walton Bros	1,050 00

Class No. 60. Varnish, spirits turpentine:

Joseph L. Savage	558 00
George H. Creed	657 90
Gayle & Co	538 70
Wilson & Magraw	552 75
W. F. Hyatt	491 44
A. P. Brown	546 25
Walton Bros	*464 25

Class No. 63. Sperm and lard oil:

Joseph L. Savage	3,360 00
George H. Creed	3,400 00
David Babcock & Co	*3,080 00
Gayle & Co	3,360 00
Wilson & Magraw	3,504 00
J. W. Buker	3,440 00
W. F. Hyatt	3,480 00
A. P. Brown	3,316 00
E. T. Howe	4,010 00

Class No. 65. Fish-oil: †

Joseph L. Savage	100 00
George H. Creed	65 00
David Babcock & Co	75 00
George T. Vaughan	69 00
Wilson & Magraw	$61 00
W. F. Hyatt	55 00
A. P. Brown	55 00

Class No. 69. Brushes:

Joseph L. Savage	140 00
George H. Creed	140 00
Wilson & Magraw	194 00
W. F. Hyatt	84 00
A. P. Brown	70 00
S. C. Carll & Co	*65 00

Class No. 71. Stationery:

William Ballantyne	757 00
W. H. Dempsey	*721 53

Class No. 73. Ship-chandlery: †

Joseph L. Savage	278 10
George H. Creed	292 05
George T. Vaughan	264 47
Wilson & Magraw	248 55
J. W. Buker	309 25
W. F. Hyatt	236 84
A. P. Brown	223 30
George Dunbar & Co	235 25

Class No. 74. Acids.

Joseph L. Savage	240 00
George H. Creed	*140 00
Wilson & Magraw	300 00
J. W. Buker	200 00
W. F. Hyatt	170 00
A. P. Brown	156 00
Walton Bros	145 00
George Dunbar & Co	‡125 00

Class No. 85. Anthracite coal.

Howard Snelling & Co	5,444 00
David Babcock & Co	*5,324 00
C. E. Walker & Co	5,440 00
S. G. French	5,550 60
W. F. Hyatt	7,237 50
A. P. Brown	6,375 00

Class No. 88. Charcoal:

David Babcock & Co	773 00
A. A. McCullough	810 00
S. G. French	653 00
W. F. Hyatt	674 00
A. P. Brown	500 00
Walton Bros	*300 00

Opened in presence of—
I. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk.*
B. T. HANLEY, *Clerk.*

NAVY DEPARTMENT,
BUREAU OF CONSTRUCTION AND REPAIR, *June* 8, 1875.

*Accepted. † Class not awarded. ‡ Received too late.

Offers to furnish material for the Navy under the advertisement of the Bureau of Construction and Repair of April 28, 1875, at the navy-yard, Boston, Mass.

Class. Live-oak:

S. P. Brown	$46,000 00
James Bigler & Co	45,150 00
William White & Son	43,550 00
John Trickey	43,250 00
Southard & Co	*33,625 00
W. C. N. Swift	45,150 00
S. C. Carll & Co	46,450 00

Class No. 1. White-oak logs:

A. A. McCollough	*§7,500 00
William M. Shakespear	11,100 00
Mann & Co	7,500 00
S. P. Brown	10,800 00
Elisha H. Jewett	9,000 00
Thomas W. Butt	11,850 00
James Bigler & Co	9,750 00
A. H. Lindsay	7,500 00
William White & Son	8,100 00
John Trickey	7,500 00
A. Ammerman	7,650 00
Austin P. Brown	7,950 00
Joseph L. Savage	9,600 00
J. B. McPherson	11,700 00
George T. Wallace	10,050 00
R. J. Neely	9,900 00
J. W. Crowell	9,750 00
Southard & Co	8,910 00
R. H. Hawley	7,500 00
S. C. Carll & Co	10,950 00

Class No. 13. White-pine plank, boards:

A. A. McCullough	3,925 00
J. W. Gaskill & Sons	3,855 00
S. P. Brown	5,650 00
Elisha H. Jewett	4,400 00
John Trickey	3,955 00
Austin P. Brown	3,955 00
J. B. McPherson	5,800 00
R. J. Neely	4,050 00
Watson & Pittinger	3,590 00
Southard & Co	3,552 00
Joseph W. Duryee	*3,475 00
George A. Hammond	4,450 00
S. C. Carll & Co	3,700 00

Class No. 15. White ash:

A. A. McCullough	675 00
J. W. Gaskill & Sons	782 50
S. P. Brown	850 00
Elisha H. Jewett	760 00
John Trickey	640 00
Austin P. Brown	612 50
R. J. Neely	862 50
Watson & Pittinger	725 00
Southard & Co	*556 25
Joseph W. Duryee	587 50
S. C. Carll & Co	750 00

Class No. 18. Black walnut, &c.:

A. A. McCullough	120 00
S. P. Brown	195 00
Elisha H. Jewett	$120 00
John Trickey	*117 00
Austin P. Brown	143 50
R. J. Neely	187 50
Watson & Pittinger	225 00
Southard & Co	143 50
Joseph W. Duryee	150 00
S. C. Carll & Co	150 00

Class No. 23. Black spruce:

A. A. McCullough	*1,329 50
J. W. Gaskill & Sons	1,392 50
S. P. Brown	1,987 50
Elisha H. Jewett	4,150 00
John Trickey	2,042 50
Austin P. Brown	1,445 00
R. J. Neely	1,650 00
Watson & Pittinger	2,500 00
Southard & Co	1,385 00
George A. Hammond	1,870 00
Joseph Wescott & Son	1,545 00
S. C. Carll & Co	5,300 00

Class No. 25. Lignum-vitæ:

A. A. McCullough	447 00
David Babcock & Co	*354 00
Elisha H. Jewett	510 00
John Trickey	390 00
Austin P. Brown	474 00
Watson & Pittinger	660 00
Southard & Co	417 00
George A. Hammond	558 00

Class No. 34. Iron plate:

George H. Creed	695 41
W. F. Hyatt	*539 61
Austin P. Brown	725 55

Class No. 35. Steel:

George H. Creed	*140 00
W. F. Hyatt	146 35
Austin P. Brown	155 00
Joseph L. Savage	154 00
Walton Bros	145 00
George Dunbar & Co	190 00

Class No. 37. Iron spikes: †

David Babcock & Co	57 50
W. F. Hyatt	51 25
Austin P. Brown	39 70
Joseph L. Savage	80 00
S. C. Carll & Co	60 00

Class No. 38. Iron wrought nails: †

Gayle & Co	$48 00
W. F. Hyatt	52 00
Austin P. Brown	46 00
Joseph L. Savage	120 00

Class No. 39. Iron cut nails:

Gayle & Co	373 25
W. F. Hyatt	*344 00

*Accepted. † Class not awarded. § Decided by lot.

P. Brown	$354 50
L. Savage	403 00
arll & Co	366 00

2. Lead: †

& Co	180 00
H. Creed	175 00
Babcock & Co	180 00
Hyatt	173 34
P. Brown	170 00
L. Savage	240 00
n Bros	175 00
Dunbar & Co	190 00

1. Augers:

H. Creed	58 10
Babcock & Co	94 20
Hyatt	*56 26
P. Brown	132 00
L. Savage	171 00
Dunbar & Co	69 00

3. Tools for yard

H. Creed	69 55
Babcock & Co	*67 80
Hyatt	83 25
P. Brown	77 00
L. Savage	140 00

4. Hardware:

H. Creed	126 00
Babcock & Co	183 40
Hyatt	125 90
P. Brown	146 50
L. Savage	149 00
arll & Co	*115 40

7. Zinc-paint:

& Co	400 00
H. Creed	*300 00
Hyatt	375 00
Buker	375 00
P. Brown	349 50
L. Savage	475 00
n Bros	312 50
on Bros. & Co	375 00
Dunbar & Co	475 00

8. Colored paints:

& Co	226 00
H. Creed	*150 50
Hyatt	183 00
P. Brown	179 00
L. Savage	308 00
n Bros	168 00
l & Phillips	200 00
on Bros. & Co	181 00

9. Linseed-oil:

& Co	1,080 00
H. Creed	*960 00

Accepted.

David Babcock & Co	$1,020 00
W. F. Hyatt	975 00
J. W. Buker	1,050 00
Austin P. Brown	1,125 00
Joseph L. Savage	1,035 00
Walton Bros	1,050 00

Class No. 63. Sperm and lard oil:

Gayle & Co	1,912 00
George H. Creed	1,858 00
David Babcock & Co	*1,815 00
W. F. Hyatt	2,068 00
J. W. Buker	2,107 40
Austin P. Brown	1,868 00
Joseph L. Savage	2,520 00

Class No. 64. Tallow, soap: †

Galye & Co	62 00
George H. Creed	66 00
David Babcock & Co	68 00
W. F. Hyatt	52 75
J. W. Buker	53 00
Austin P. Brown	51 00
Joseph L. Savage	64 00

Class No. 68. Glass: †

Gayle & Co	106 43
George H. Creed	89 10
W. F. Hyatt	77 50
Austin P. Brown	67 44

Class No. 69. Brushes:

George H Creed	*28 20
W. F. Hyatt	30 30
Austin P. Brown	35 00
Joseph L. Savage	38 00
S. C. Carll & Co	75 34

Class No. 71. Stationery:

William Ballantyne	568 70
William H. Dempsey	*463 77

Class No. 73. Ship-chandlery:

Gayle & Co	*148 00
George H. Creed	150 25
W. F. Hyatt	156 65
J. W. Buker	207 00
Austin P. Brown	167 50
Joseph L. Savage	184 50
George Dunbar & Co	134 00

Class No. 74. Acids:

Gayle & Co	422 96
George H. Creed	658 68
W. F. Hyatt	429 14
William H. Dempsey	*389 04
Austin P. Brown	423 76
Joseph L. Savage	389 85

Class No. 77. Belting, &c.:

Gayle & Co	1,146 00
George H. Creed	*879 00
W. F. Hyatt	994 00

† Class not awarded.

Austin P. Brown	$1,018 50
Joseph L. Savage	998 00
Walton Bros	1,095 50
George Dunbar & Co	1,176 00

Class No. 85. Anthracite coal:

David Babcock & Co	8,736 00
W. F. Hyatt	10,920 00
Howard Snelling & Co.	*8,666 00
Sam'l G. French	8,862 00
Austin P. Brown	10,850 00

Class No. 87. Bituminous coal:

David Babcock & Co	2,312 00
W. F. Hyatt	2,800 00
Howard Snelling & Co	$2,316 00
Samuel G. French	2,532 00
Austin P. Brown	2,800 00
Alexander Ray	*2,296 00
Walton Brothers	2,500 00

Class No. 88. Charcoal:

George H. Creed	125 00
David Babcock & Co	*120 00
W. F. Hyatt	130 00
Samuel G. French	175 00
Walton Brothers	175 00
A. A. McCullough	130 00

Opened in presence of—
I. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk.*
B. T. HANLEY, *Clerk.*

NAVY DEPARTMENT.
BUREAU OF CONSTRUCTION AND REPAIR, *June* 8, 1875.

Offers to furnish material for the Navy, under the advertisement of the Bureau of Construction and Repair of April 28, 1875, at the navy-yard, New York.

Class. Live-oak:

S. P. Brown	$89,500 00
James Bigler & Co	85,300 00
William White & Son	81,100 00
John Trickey	86,500 00
James Cassin	78,900 00
Southard & Co	*67,250 00
W. C. N. Swift	85,300 00
S. C. Carll & Co	88,000 00

Class No. 4. White-oak plank:

A. A. McCullough	11,500 00
William M. Shakespear	14,800 00
J. B. McPherson	18,400 00
H. F. Cady	12,000 00
S. P. Brown	17,600 00
James Bigler & Co	10,980 00
John Trickey	12,000 00
Joseph L. Savage	10,770 00
A. Ammerman	11,600 00
Austin P. Brown	14,360 00
Watson & Pittinger	11,800 00
Southard & Co	11,354 00
S. C. Carll & Co	*10,100 00

Class No. 16. White-ash oars:

David Babcock & Co	217 50
W. F. Hyatt	217 50
Joseph L. Savage	270 00
Austin P. Brown	232 50
Watson & Pittinger	420 00
De Grauld, Aymar & Co.	*202 50

Class No. 18. Black walnut, &c.:

A. A. McCullough	200 00
S. P. Brown	250 00
John Trickey	*160 00
Austin P. Brown	186 00
George A. Hammond	$254 00
R. J. Neely	198 00
Watson & Pittinger	260 00
Southard & Co	178 00
Joseph W. Duryee	200 00
S. C. Carll & Co	200 00

Class No. 22. Cypress, cedar:

A. A. McCullough	550 00
J. W. Gaskill & Sons	700 00
John Trickey	440 00
Austin P. Brown	470 00
George A. Hammond	640 00
George T. Wallace	480 00
R. J. Neely	570 00
Watson & Pettinger	*420 00
Southard & Co	515 00
Jos. W. Duryee	650 00
S. C. Carll & Co	700 00

Class No. 23. Black spruce:†

A. A. McCullough	2,920 00
J. W. Gaskill & Sons	1,370 00
S. P. Brown	1,775 00
John Trickey	2,815 00
Austin P. Brown	2,040 00
George A. Hammond	2,320 00
R. J. Neely	2,675 00
Watson & Pettinger	2,215 00
Southard & Co	1,872 50
Joseph Wescott & Son	2,400 00
S. C. Carll & Co	4,550 00

Class No. 24. White-oak staves, &c.:

A. A. McCullough	*287 50
David Babcock & Co	515 00
W. F. Hyatt	470 00

Accepted.

† Class not awarded.

.. Savage	$520 00
'. Brown	535 00
·ly	375 00
& Pettinger	550 00

Zinc:

I. Creed	2,070 00
abcock & Co	2,137 50
yatt	*2,062 50
.. Savage	2,100 00
'. Brown	2,097 00
Bros	2,250 00
rll & Co	2,400 00

Tin:†

I. Creed	820 00
abcock & Co	622 50
yatt	677 30
L. Savage	690 00
'. Brown	620 00
Bros	735 00
·ll & Co	1,200 00

White lead:

I. Creed	*2,240 00
yatt	2,250 00
.. Savage	2,625 00
'. Brown	2,242 50
Bros	2,375 00
Bros. & Co	2,492 50
rll & Co	2,750 00

Colored paints.†

I. Creed	1,013 00
yatt	1,024 50
'. Brown	979 90
Bros	1,077 40
& Phillips	1,275 00
Bros. & Co	1,099 70

Linseed-oil:

I. Creed	*4,200 00
abcock & Co	4,690 00
yatt	4,445 00
L. Savage	4,830 00
ıker	4,900 00
'. Brown	5,110 00
Bros	4,900 00

Varnish, &c.:

I. Creed	720 00
yatt	730 00
.. Savage	800 00
ıker	*660 00
'. Brown	700 00
Bros	720 00

Class No. 64. Tallow, soap:†

George H. Creed	$270 00
David Babcock & Co	300 00
W. F. Hyatt	281 88
Joseph L. Savage	275 00
J. W. Buker	435 00
Austin P. Brown	245 00

Class No. 65. Fish-oil:†

George H. Creed	110 00
David Babcock & Co	114 00
W. F. Hyatt	100 00
Joseph L. Savage	92 00
Austin P. Brown	110 00

Class No. 70. Dry-goods:†

George H. Creed	667 50
W. F. Hyatt	696 50
Joseph L. Savage	600 50
J. W. Buker	860 00
Austin P. Brown	710 00
S. C. Carll & Co	666 50

Class No. 71. Stationery:

William Ballantyne	396 03
William H. Dempsey	*330 57

Class No. 80. Junk:†

George H. Creed	7,200 00
David Babcock & Co	7,660 80
Joseph L. Savage	8,400 00
Austin P. Brown	6,600 00
Walton Bros	16,500 00

Class No. 85. Anthracite coal:

David Babcock & Co	*10,255 00
W. F. Hyatt	12,585 00
Samuel G. French	10,537 00
Austin P. Brown	10,600 00

Class No. 86. Semi-bituminous coal:

George H. Creed	5,690 00
David Babcock & Co	5,590 00
W. F. Hyatt	5,900 00
Samuel G. French	5,650 00
Austin P. Brown	6,750 00
Robert H. Powel & Co	*5,570 00
Walton Bros	5,750 00

Class No. 88. Charcoal.

A. A. McCullough	1,556 00
David Babcock & Co	1,180 00
W. F. Hyatt	1,170 00
Samuel G. French	*§1,040 00
Austin P. Brown	1,100 00
Walton Bros	1,040 00

presence of—
ISCOM, *Chief of Bureau.*
GOLDSBOROUGH, *Chief Clerk.*
HANLEY, *Clerk.*

'ARTMENT,
EAU OF CONSTRUCTION AND REPAIR, *June* 8, 1875.

ccepted. † Class not awarded. § Decided by lot.

Offers to furnish material for the Navy, under the advertisement of the Bureau of Construction and Repair of April 28, 1875, at the navy-yard, Philadelphia, (or League Island, as the Department may direct.)

Class No. 1. White-oak logs:

William White & Son	$37,800 00
John Trickey	39,000 00
A. Ammerman	33,000 00
Joseph L. Savage	32,400 00
A. A. McCullough	36,000 00
William M. Shakespear	44,400 00
Mann & Co	*24,000 00
S. P. Brown	44,400 00
J. B. McPherson	47,400 00
Thomas W. Butt	44,400 00
James Bigler & Co	34,200 00
Southard & Co	34,140 00
Hertzog & Wagner	(‖)
R. H. Hawley	28,200 00
S. C. Carll & Co	43,800 00

Class No. 4. White-oak plank: †

John Trickey	13,220 00
A. Ammerman	11,000 00
Joseph L Savage	8,660 00
A. A. McCullough	11,600 00
William M. Shakespear	14,400 00
Mann & Co	9,000 00
S. P. Brown	17,600 00
J. B. McPherson	18,400 00
James Bigler & Co	11,750 00
Southard & Co	10,753 00
Hertzog & Wagner	(‖)
R. H. Hawley	10,600 00
S. C. Carll & Co	10,100 00

Class No. 6. Yellow-pine plank:

John Trickey	2,590 00
A. Ammerman	2,800 00
A. A. McCullough	2,790 00
J. W. Gaskill & Sons	2,015 00
William M. Shakespear	2,795 00
Mann & Co	3,250 00
S. P. Brown	4,095 00
J. B. McPherson	4,355 00
James Bigler & Co	2,600 00
Austin P. Brown	2,795 00
George T. Wallace	3,900 00
R. J. Neely	2,860 00
Watson & Pittinger	*1,950 00
Southard & Co	2,450 50
R. H. Hawley	2,600 00
S. C. Carll & Co	2,575 00

Class No. 9. Yellow-pine mast-timber: †

William White & Son	730 75
John Trickey	616 74
George Patterson	811 50
A. A. McCullough	665 43
J. W. Gaskill & Sons	681 66
William M. Shakespear	779 04
S. P. Brown	1,038 72
J. B. McPherson	1,379 55
A. H. Lindsay	$795 27
Austin P. Brown	730 35
George T. Wallace	892 65
R. J. Neely	892 65
Watson & Pittinger	616 74
Southard & Co	681 66
George Patterson	811 50
R. H. Hawley	811 50
S. C. Carll & Co	1,623 00

Class No. 11. White-pine logs:

John Trickey	2,500 00
A. A. McCullough	*1,450 00
J. W. Gaskill & Sons	1,800 00
William M. Shakespear	4,750 00
S. P. Brown	3,450 00
William S. Doughton	3,000 00
James Bigler & Co	1,950 00
Austin P. Brown	3,250 00
R. J. Neely	2,237 50
Watson & Pittinger	1,750 00
Southard & Co	1,545 00
R. H. Hawley	2,250 00
S. C. Carll & Co	6,250 00

Class No. 12. White-pine mast-timber:

John Trickey	275 00
A. A. McCullough	380 00
William M. Shakespear	480 00
S. P. Brown	380 00
Austin P. Brown	380 00
R. J. Neely	390 00
Watson & Pittinger	400 00
Southard & Co	480 00
R. H. Hawley	*150 00

Class No. 13. White-pine plank, boards: †

John Trickey	30,993 00
A. A. McCullough	24,280 00
J. W. Gaskill & Sons	20,599 50
William M. Shakespear	24,700 00
S. P. Brown	36,768 00
J. B. McPherson	39,730 00
William S. Doughton	29,424 50
Lewis Thompson & Co	24,939 00
James Bigler & Co	22,746 00
Austin P. Brown	26,781 00
R. J. Neely	23,750 00
Watson & Pittinger	22,440 00
Southard & Co	22,568 00
Joseph W. Duryee	22,970 00
R. H. Hawley	23,590 00
S. C. Carll & Co	23,698 00

Class No. 15. White ash:

John Trickey	558
A. A. McCullough	531
J. W. Gaskill & Sons	459
William M. Shakespear	538

*Accepted. † Class not awarded. ‖ Informal.

rown	$697 00
Thompson & Co	486 88
P. Brown	476 62
eely	610 00
& Pittinger	543 25
rd & Co	486 87
W. Duryee	502 25
Iawley	*410 00
arll & Co	615 00

. White-ash oars:

L. Savage	150 00
n M. Shakespear	450 00
Babcock & Co	153 00
Iyatt	127 50
P. Brown	144 00
& Pittinger	270 00
uw, Aymar & Co	*126 00

8. Black walnut,

Trickey	250 75
IcCullough	261 75
Gaskill & Sons	270 00
n M. Shakespear	270 00
rown	342 50
Thompson & Co	263 75
P. Brown	249 50
eely	275 00
& Pittinger	450 00
rd & Co	276 00
W. Duryee	285 00
Patterson	283 50
arll & Co	300 00

. Cypress, cedar: †

Trickey	255 00
Patterson	280 00
IcCullough	282 00
Gaskill & Sons	340 00
n M. Shakespear	300 00
rown	450 00
P. Brown	235 00
T. Wallace	235 00
eely	298 00
& Pittinger	240 00
rd & Co	320 00
W. Duryee	300 00
arll & Co	350 00

3. Black spruce:

Trickey	*212 50
IcCullough	276 25
Gaskill & Sons	228 75
Brown	308 75
P. Brown	412 50
Ieely	447 50
& Pittinger	422 50
rd & Co	259 00
Wescott & Son	262 50

5. Lignum-vitæ:

Trickey	663 00
IcCullough	770 00
Lewis Thompson & Co	$545 00
David Babcock & Co	*504 00
Austin P. Brown	575 00
Watson & Pittinger	760 00
Southard & Co	580 00

Class No. 34. Iron plates:

Joseph L. Savage	400 14
Paul J. Field	546 90
W. F. Hyatt	*313 37
Austin P. Brown	418 61

Class No. 38. Iron wrought nails: †

Joseph L. Savage	45 00
Paul J. Field	90 00
W. F. Hyatt	29 70
Austin P. Brown	18 00

Class No. 39. Iron cut nails: †

Joseph L. Savage	246 00
Paul J. Field	286 00
W. F. Hyatt	246 80
Austin P. Brown	300 90
S. C. Carll & Co	336 30

Class No. 42. Lead: †

Joseph L. Savage	460 00
Paul J. Field	457 50
David Babcock & Co	457 50
W. F. Hyatt	425 00
Austin P. Brown	405 00
Walton Bros	437 50

Class No. 43. Zinc: †

Joseph L. Savage	1,095 00
Paul J. Field	1,781 25
George H. Creed	1,135 00
David Babcock & Co	1,260 00
W. F. Hyatt	1,160 00
Austin P. Brown	1,195 62
Walton Bros	1,196 25
S. C. Carll & Co	1,262 50

Class No. 44. Tin: †

Joseph L. Savage	435 00
Paul J. Field	675 00
George H. Creed	605 00
David Babcock & Co	565 00
W. F. Hyatt	587 00
Austin P. Brown	625 00
Walton Bros	555 00
S. C. Carll & Co	780 00

Class No. 45. Solder:

Joseph L. Savage	90 00
Paul J. Field	99 00
George H. Creed	78 00
David Babcock & Co	84 00
W. F. Hyatt	85 50
Austin P. Brown	105 00
S. C. Carll & Co	*75 00

* Accepted.

† Class not awarded.

Class No. 48. Locks, hinges, &c.: †

Joseph L. Savage	$463 00
Paul J. Field	782 75
David Babcock & Co	720 80
W. F. Hyatt	511 41
Austin P. Brown	614 02

Class No. 49. Screws:

Joseph L. Savage	1,113 30
Paul J. Field	1,086 93
George H. Creed	943 56
W. F. Hyatt	*941 06
Austin P. Brown	1,132 19
S. C. Carll & Co	1,951 02

Class No. 50. Files: †

Joseph L. Savage	407 03
Paul J. Field	519 93
George H. Creed	446 85
David Babcock & Co	519 58
W. F. Hyatt	425 98
Austin P. Brown	450 54
Walton Bros	470 29

Class No. 51. Augers:

Paul J. Field	639 20
George H. Creed	565 62
David Babcock & Co	609 00
W. F. Hyatt	*540 32
Austin P. Brown	717 20

Class No. 53. Tools for yard use:

Joseph L. Savage	849 80
Paul J. Field	1,423 15
David Babcock & Co	*830 31
W. F. Hyatt	866 62
Austin P. Brown	1,007 10

Class No. 54. Hardware:

Joseph L. Savage	839 65
Paul J. Field	964 42
David Babcock & Co	908 09
W. F. Hyatt	*743 78
Austin P. Brown	757 92
S. C. Carll & Co	1,541 20

Class No. 56. White-lead:

Joseph L. Savage	950 00
George H. Creed	940 00
Harrison Bros. & Co	973 00
W. F. Hyatt	*900 00
Austin P. Brown	915 00
Walton Bros	950 00
S. C. Carll & Co	1,100 00

Class No. 58. Colored paints: †

George H. Creed	640 12
Harrison Bros. & Co	609 56
W. F. Hyatt	586 00
Austin P. Brown	569 75
Walton Bros	619 62
Russell & Phillips	653 25

Class No. 59. Linseed-oil:

Joseph L. Savage	$1,035
George H. Creed	975
David Babcock & Co	1,020
W. F. Hyatt	*§975
Austin P. Brown	1,125
Walton Bros	1,050

Class No. 60. Varnish, &c.:

Joseph L. Savage	999 [illegible]
George H. Creed	815 [illegible]
W. F. Hyatt	*722 [illegible]
Austin P. Brown	729 [illegible]
Walton Bros	817 [illegible]

Class No. 63. Sperm and lard oil:

Joseph L. Savage	625 00
George H. Creed	*475 00
David Babcock & Co	495 00
W. F. Hyatt	512 50
Austin P. Brown	500 00

Class No. 64. Tallow, soap: †

Joseph L. Savage	19 [illegible]
Paul J. Field	30 [illegible]
George H. Creed	23 [illegible]
W. F. Hyatt	18 [illegible]
Austin P. Brown	15 [illegible]

Clas [illegible] †

George H. Creed	331 [illegible]
W. F. Hyatt	248 [illegible]
Austin P. Brown	236 [illegible]
Russell & Phillips	331 [illegible]

Class No. 69. Brushes:

Joseph L. Savage	350 [illegible]
George H. Creed	366 [illegible]
W. F. Hyatt	*293 [illegible]
Russell & Phillips	599 [illegible]
S. C. Carll & Co	664 [illegible]

Class No. 71. Stationery:

William H. Dempsey	*197
William Ballantyne	244

Class No. 73. Ship-chandlery:

Joseph L. Savage	473
Paul J. Field	564
W. F. Hyatt	*467

Class No. 74. Acids:

William H. Dempsey	1,378 [illegible]
Joseph L. Savage	44[illegible]
W. F. Hyatt	*40[illegible]

Class No. 75. Rosin, pitch, &c.:

Loper & Doughton	1[illegible]7
Joseph L. Savage	1[illegible]7
A. A. McCullough	2[illegible]9
W. F. Hyatt	*[illegible]34

*Accepted. † Class not awarded. § Decided by lot.

Class No. 77. Belting, packing:

Joseph L. Savage	$647 00
Paul J. Field	762 50
W. F. Hyatt	*524 08
Austin P. Brown	594 60
Walton Bros	626 00

Class No. 78. Leather:†

Joseph L. Savage	117 40
W. F. Hyatt	76 65
Austin P. Brown	70 88
Walton Bros	74 70

Class No. 85. Anthracite coal:

Samuel G. French	*1,968 75
W. F. Hyatt	2,115 00

Class No. 87. Bituminous coal:

Samuel G. French	$1,770 00
Joseph L. Savage	2,025 00
W. F. Hyatt	1,680 00
Robert H. Powel & Co.	*1,557 00
Alexander Ray	1,590 00
Walton Bros	1,575 00

Class No. 88. Charcoal:

Samuel G. French	595 00
Joseph L. Savage	800 00
A. A. McCullough	776 00
Paul J. Field	635 00
W. F. Hyatt	615 00
Thomas Simpson	636 00
Walton Bros	550 00

Opened in presence of—
I. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk.*
B. T. HANLEY, *Clerk.*

NAVY DEPARTMENT,
BUREAU OF CONSTRUCTION AND REPAIR, *June* 8, 1875.

Bids to furnish material for the Navy, under the advertisement of the Bureau of Construction and Repair of April 28, 1875, *at the navy-yard, Washington, D. C.*

Class No. 18. Black walnut, &c.:

John Trickey	$111 40
Joseph L. Savage	332 40
S. P. Brown	382 40
Austin P. Brown	154 82
R. J. Neely	*103 50

Class No. 23. Black spruce:†

John Trickey	530 00
J. W. Gaskill & Sons	420 00
Joseph L. Savage	620 00
S. P. Brown	735 00
Austin P. Brown	540 00
R. J. Neely	560 00
Southard & Co	561 00
Joseph Wescott & Son	700 00

Class No. 35. Steel:

Joseph L. Savage	462 50
W. F. Hyatt	*411 84
George P. Goff	309 85
Austin P. Brown	421 85
Walton Bros	414 70

Class No. 43. Zinc:

Joseph L. Savage	225 00
W. F. Hyatt	221 25
George P. Goff	*219 00
David Babcock & Co	240 00
Austin P. Brown	221 25
Walton Bros	228 75

*Accepted.

Class No. 44. Tin:†

Joseph L. Savage	$867 20
W. F. Hyatt	846 76
George P. Goff	916 00
David Babcock & Co	800 00
Austin P. Brown	789 00
Walton Bros	829 00

Class No. 53. Tools for yard use:†

Joseph L. Savage	2,572 80
W. F. Hyatt	3,270 47
Austin P. Brown	3,328 39

Class No. 54. Hardware:

Joseph L. Savage	1,091 28
W. F. Hyatt	*838 59
George P. Goff	988 53
Austin P. Brown	990 16

Class No. 58. Colored paints:

Joseph L. Savage	110 00
W. F. Hyatt	126 50
George P. Goff	196 00
J. W. Buker	1,556 00
Austin P. Brown	75 00
Walton Bros	*63 50
Russell & Phillips	122 50
Harrison Bros. & Co	88 00

Class No. 59. Linseed-oil:

Joseph L. Savage	414 00
W. F. Hyatt	*408 00

†Class not awarded.

George P. Goff	$432 00
J. W. Buker	450 00
David Babcock & Co	414 00
Austin P. Brown	450 00
Walton Bros	420 00

Class No. 60. Varnish, &c: †

Joseph L. Savage	225 00
W. F. Hyatt	145 50
George P. Goff	157 50
J. W. Buker	191 50
Austin P. Brown	142 00
Walton Bros	152 75

Class No. 63. Sperm and lard oil:

Joseph L. Savage	750 00
W. F. Hyatt	804 00
George P. Goff	782 70
J. W. Buker	791 50
David Babcock & Co	*742 50
Austin P. Brown	743 00

Class No. 64. Tallow, soap: †

Joseph L. Savage	57 00
W. F. Hyatt	63 00
George P. Goff	57 00
J. W. Buker	102 00
David Babcock & Co	66 00
Austin P. Brown	52 50

Class No. 69. Brushes:

Joseph L. Savage	19 50
W. F. Hyatt	22 50
George P. Goff	*17 60
J. W. Buker	26 50
Austin P. Brown	25 50
Russell & Phillips	26 00

Class No. 70. Dry goods: †

Joseph L. Savage	$59
W. F. Hyatt	60
George P. Goff	71
J. W. Buker	124
Austin P. Brown	76

Class No. 71. Stationery:

William H. Dempsey	*226
William Ballantyne	270

Class No. 73. Ship-chandlery: †

Joseph L. Savage	198 0
W. F. Hyatt	300 5
George P. Goff	250 93
J. W. Buker	343 50
Austin P. Brown	236 45

Class No. 74. Acids, &c.:

Joseph L. Savage	171 92
W. F. Hyatt	*98 58
J. W. Buker	104 35
Austin P. Brown	112 60

Class No. 77. Belting, &c:

Joseph L. Savage	430 45
W. F. Hyatt	*385 1
George P. Goff	596 9
Austin P. Brown	525 1
Walton Bros	471 [illegible]

Class No. 78. Leather:

Joseph L. Savage	57 [illegible]
W. F. Hyatt	65 [illegible]
George P. Goff	79 [illegible]
J. W. Buker	*52 [illegible]
Austin P. Brown	88 [illegible]
Walton Bros	57 [illegible]

Opened in presence of—
J. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk.*
B. T. HANLEY, *Clerk.*

NAVY DEPARTMENT,
BUREAU OF CONSTRUCTION AND REPAIR, *June* 8, 1875.

Offers to furnish material for the Navy, under the advertisement of the Bureau of Construction and Repair of April 28, 1875, *at the navy-yard, Norfolk, Virginia.*

Class. Live oak:

A. A. McCullough	$40,000 00
S. P. Brown	37,550 00
John Trickey	43,250 00
James Bigler & Co	42,650 00
William White & Son	38,500 00
James Cassin	39,450 00
Southard & Co	*32,550 00
W. C. N. Swift	42,650 00
S. C. Carll & Co	44,000 00

Class No. 3. White-oak curved timber

A. H. Lindsay	$2,886
A. A. McCullough	2,183
William M. Shakespear	2,738
S. P. Brown	5,550
John Trickey	2,960
William White & Son	*§ 1,813
George T. Wallace	4,625
R. J. Neely	3,663
J. W. Crowell & Co	2,146

* Accepted. † Class not awarded. § Decided by lot.

ard & Co	$2,937 80
rd Fentress	1,905 50
e Patterson	1,813 00
Carll & Co	3,700 00

11. White-pine logs:

McCullough	*1,550 00
Gaskill & Sons	2,250 00
Brown	3,500 00
Trickey	2,400 00
s Bigler & Co	2,250 00
am White & Son	3,000 00
n P. Brown	3,250 00
Neely	2,137 50
on & Pittinger	1,950 00
ard & Co	1,970 00
Hawley	2,000 00
Carll & Co	6,250 00

15. White-ash:

McCullough	501 00
Gaskill & Sons	551 50
Brown	672 00
Trickey	632 50
n P. Brown	509 50
Neely	598 50
on & Pittinger	556 50
ard & Co	567 00
h W. Duryee	577 50
rd Fentress	*417 31
Carll & Co	525 00

18. Black walnut,

McCullough	1,545 50
Gaskill & Sons	1,889 00
Brown	1,863 00
Trickey	1,769 40
n P. Brown	1,885 70
Neely	1,796 00
on & Pittinger	2,159 00
ard & Co	1,855 80
h W. Duryee	1,575 00
e Patterson	1,583 00
Hawley	1,500 00
Carll & Co	*1,478 00

22. Cypress, cedar:

McCullough	475 00
Gaskill & Sons	697 50
s & Brother	481 50
Brown	735 00
Trickey	*405 00
n P. Brown	493 50
e T. Wallace	451 50
Neeley	510 00
on & Pittinger	493 50
ard & Co	457 50
rd Fentress	570 00
e Patterson	414 00
Carll & Co	525 00

. 24. White-oak &c.:

Hyatt	797 50
McCullough	480 00
David Babcock & Co	$895 00
Peters & Brother	497 00
Austin P. Brown	1,005 00
Joseph L. Savage	1,025 00
R. J. Neely	630 00
Watson & Pittinger	995 00
E. B. Lookins	*430 00
Richard Fentress	500 00

Class No. 43. Zinc:

A. H. Lindsay	1,980 00
W. F. Hyatt	1,332 00
David Babcock & Co	1,440 00
George P. Goff	*1,305 00
Austin P. Brown	1,332 00
Joseph L. Savage	1,440 00
Walton Brothers	1,372 50
S. C. Carll & Co	1,440 00

Class No. 44. Tin:

W. F. Hyatt	*13 44
Austin P. Brown	14 40
Joseph L. Savage	57 60

Class No. 49. Screws:

W. F. Hyatt	*83 22
George P. Goff	118 00
Austin P. Brown	85 70
Joseph L. Savage	85 10
S. C. Carll & Co	136 44

Class No. 50. Files:

W. F. Hyatt	*553 06
David Babcock & Co	*631 10
George P. Goff	562 72
Austin P. Brown	567 13
Joseph L. Savage	628 30
Walton Brother	603 47
E. B. Lookins	700 00

Class No. 54. Hardware:

W. F. Hyatt	492 59
David Babcock & Co	602 97
George P. Goff	*436 77
Austin P. Brown	626 96
Joseph L. Savage	479 86
S. C. Carll & Co	1,835 00

Class No. 56. White lead:†

A. H. Lindsay	1,245 00
W. F. Hyatt	1,019 88
George P. Goff	1,014 00
Austin P. Brown	968 35
Joseph L. Savage	905 00
Walton Bros	995 00
Harrison Bros. & Co	1,041 10
S. C. Carll & Co	1,245 00

Class No. 57. Zinc paint:

A. H. Lindsay	1,195 00
W. F. Hyatt	929 50
George P. Goff	987 50
Austin P. Brown	835 00
Joseph L. Savage	920 00
Walton Bros	*768 75
Russell & Phillips	967 50
Harrison Bros. & Co	933 35

* Accepted.

† Decided by lot.

Class No. 58. Colored paints:†

W. F. Hyatt	$1,077 50
George P. Goff	1,311 50
Austin P. Brown	688 00
Joseph L. Savage	1,130 00
Walton Bros	990 00
Russell & Phillips	1,727 60
Harrison Bros. & Co	1,125 00

Class No. 59. Linseed oil:†

A. H. Lindsay	1,649 50
W. F. Hyatt	1,591 60
David Babcock & Co	1,640 05
George P. Goff	1,680 25
Austin P. Brown	1,729 85
Joseph L. Savage	1,465 00
Walton Bros	1,636 50

Class No. 60. Varnish, &c.:

A. H. Lindsay	977 00
W. F. Hyatt	960 00
George P. Goff	995 00
Austin P. Brown	900 00
Joseph L. Savage	1,232 50
Walton Bros	*684 00
E. B. Lookins	1,250 00

Class No. 63. Sperm and lard oil:†

A. H. Lindsay	1,829 00
W. F. Hyatt	1,860 00
David Babcock & Co	1,710 00
George P. Goff	1,740 00
Austin P. Brown	1,690 00
Joseph L. Savage	1,775 00

Class No. 64. Tallow soap:†

A. H. Lindsay	202 50
W. F. Hyatt	201 75
David Babcock & Co	208 50
George P. Goff	226 50
Austin P. Brown	199 50
Joseph L. Savage	225 00
E. B. Lookins	207 00

Class No. 68. Glass:

W. F. Hyatt	*108 75
George P. Goff	146 00
Austin P. Brown	208 00
Joseph L. Savage	198 00
E. B. Lookins	119 50

Class No. 69. Brushes:

W. F. Hyatt	*147 40
George P. Goff	156 90
Austin P. Brown	270 50
Joseph L. Savage	
Russell & Phillips	
S. C. Carll & Co	

Class No. 70. Dry goods:†

W. F. Hyatt
Joseph L. Savage
E. B. Lookins

Class No. 71. Stationery:

William Ballantyne
William Dempsey
J. J. Swayne

Class No. 73. Ship-chandlery:†

J. W. Buker
W. F. Hyatt
George P. Goff
Austin P. Brown
Joseph L. Savage
E. B. Lookins

Class No. 75. Rosin, pitch, &c.:

W. F. Hyatt
A. A. McCullough
Peters & Bro
George P. Goff
Austin P. Brown
Joseph L. Savage
R. J. Neely
E. B. Lookins

Class No. 78. Leather:†

W. F. Hyatt
George P. Goff
Austin P. Brown
Joseph L. Savage
E. B. Lookins

Class No. 82. Bellows:†

W. F. Hyatt
George P. Goff
Austin P. Brown
Joseph L. Savage
E. B. Lookins

Class No. 88. Charcoal:

A. H. Lindsay
W. F. Hyatt
A. A. McCullough
Peters & Bro
Austin P. Brown
Joseph L. Savage
R. J. Neely
Neemyer & Brooks
Walton Bros
E. B. Lookins

Opened in presence of—
I. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk*
B. T. HANLEY, *Clerk.*

NAVY DEPARTMENT,
BUREAU OF CONSTRUCTION AND REPAIR, *June* 8, 1875.

* Accepted. † Class not awarded.

Offers to furnish material for the Navy, under the advertisement of the Bureau of Construction and Repair of April 28, 1875, at the navy-yard, Pensacola, Florida.

Class No. 13. White-pine plank boards:

A. A. McCullough	$14,242 00
J. W. Gaskill & Sons	4,337 00
S. P. Brown	5,235 00
James Bigler & Co	4,202 00
John Trickey	4,775 00
Austin P. Brown	4,433 00
Southard & Co	* 4,064 00

Class No. 15. White ash:

A. A. McCullough	*696 00
J. W. Gaskill & sons	868 00
S. P. Brown	1,036 00
James Bigler & Co	798 00
John Trickey	930 00
Austin P. Brown	798 00
Southard & Co	826 00

Class No. 22. Cypress, cedar:

A. A. McCullough	570 00
J. W. Gaskill & Sons	700 00
S. P. Brown	700 00
John Trickey	*$490 00
Austin P. Brown	591 00
Southard & Co	590 00

Class No. 23. Black spruce:

A. A. McCullough	595 00
J. W. Gaskill & Sons	*529 00
S. P. Brown	550 00
John Trickey	825 00
Austin P. Brown	565 00
Southard & Co	662 50

Class No. 25. Lignumvitae:

A. A. McCullough	425 00
David Babcock & Co	305 00
John Trickey	*300 00
Austin P. Brown	360 00
Southard & Co	315 00

Class No. 71. Stationery:

G. Bell	142 60
William Ballantyne	102 25
William H. Dempsey	*77 30

Opened in presence of—
I. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk.*
B. T. HANLEY, *Clerk.*

NAVY DEPARTMENT,
BUREAU OF CONSTRUCTION AND REPAIR, *June* 8, 1875.

Offers to furnish material for the Navy, under the advertisement of the Bureau of Construction and Repair of April 28, 1875, at the navy-yard, Mare Island, Cal.

Class No. 24. White-oak staves, &c.:

Austin P. Brown	$650 00
Farwell & Co	*600 00

Class No. 32. Wrought iron, round and square:

Austin P. Brown	143 75
Farwell & Co	*132 50

Class No. 33. Wrought iron, flat:

Austin P. Brown	960 00
Farwell & Co	*720 00

Class No. 34. Iron plate: †

W. F. Hyatt	2,119 26
Austin P. Brown	1,790 40
Farwell & Co	2,342 56

Class No. 35. Steel:

W. F. Hyatt	*$414 75
Austin P. Brown	441 00
Farwell & Co	514 50
Walton Bros	427 25

Class No. 39. Iron cut nails:

W. F. Hyatt	413 50
Austin P. Brown	342 25
Farwell & Co	388 75
Linforth, Kellogg & Co	*313 00

Class No. 42. Lead: †

David Babcock & Co	1,515 00
W. F. Hyatt	1,645 00
Austin P. Brown	1,413 00
Farwell & Co	1,730 00
Walton Bros	1,475 00

*Accepted.

† Class not awarded.

Class No. 43. Zinc: †

David Babcock & Co....	$780 00
W. F. Hyatt.....	800 00
Austin P. Brown.....	760 00
Farwell & Co.....	1,120 00
Walton Bros.....	760 00

Class No. 44. Tin:

David Babcock & Co....	333 00
W. F. Hyatt.....	325 50
Austin P. Brown.....	337 00
Farwell & Co.....	*305 00

Class No. 48. Locks, hinges, &c.: †

David Babcock & Co....	669 90
W. F. Hyatt.....	526 62
Austin P. Brown.....	476 00
Farwell & Co.....	575 00

Class No. 49. Screws:

W. F. Hyatt.....	*1,469 41
Austin P. Brown.....	1,658 08
Farwell & Co.....	1,573 06
Linforth, Kellogg & Co..	1,497 40

Class No. 50. Files: †

David Babcock & Co....	225 36
W. F. Hyatt.....	177 48
Austin P. Brown.....	175 80
Farwell & Co.....	222 18
Linforth, Kellogg & Co..	196 90

Class No. 51. Augers:

David Babcock & Co....	469 80
W. F. Hyatt.....	*362 42
Austin P. Brown.....	471 60
Farwell & Co.....	479 00
Linforth, Kellogg & Co..	370 00

Class No. 52. Tools for stores:

David Babcock & Co....	375 50
W. F. Hyatt.....	368 62
Farwell & Co.....	*327 30

Class No. 53. Tools for yard use:

David Babcock & Co....	872 06
W. F. Hyatt.....	*689 53
Farwell & Co.....	941 05

Class No. 54. Hardware:

David Babcock & Co....	1,256 23
W. F. Hyatt.....	*925 81
Austin P. Brown.....	1,002 54
Farwell & Co.....	1,591 25

Class No. 56. White lead:

Whittier, Fuller & Co...	*1,140 00
W. F. Hyatt.....	1,450 00
Austin P. Brown.....	$1,197 00
Farwell & Co.....	1,250 00
Walton Bros.....	1,150 00

Class No. 57. Zinc paint: †

Whittier, Fuller & Co...	290 00
W. F. Hyatt.....	300 00
Austin P. Brown.....	320 00
Farwell & Co.....	320 00
Walton Bro.....	171 00

Class No. 58. Colored paints:

Whittier, Fuller & Co...	*264 75
W. F. Hyatt.....	489 20
Austin P. Brown.....	298 15
Farwell & Co.....	282 10

Class No. 59. Linseed-oil:

Whittier, Fuller & Co...	235 00
David Babcock & Co....	285 00
W. F. Hyatt.....	222 50
Austin P. Brown.....	305 00
Farwell & Co.....	287 50
Walton Bros.....	*180 00

Class No. 60. Varnish, &c.:

Whittier, Fuller & Co...	591 40
W. F. Hyatt.....	595 50
Austin P. Brown.....	499 60
Farwell & Co.....	806 50
Walton Bros.....	*461 90

Class No. 63. Sperm and lard oil:

Whittier, Fuller & Co...	*950 00
David Babcock & Co....	1,120 00
W. F. Hyatt.....	1,125 00
Austin P. Brown.....	995 00
Farwell & Co.....	1,200 00

Class No. 64. Tallow, soap:

David Babcock & Co....	272 50
W. F. Hyatt.....	290 25
Austin P. Brown.....	282 50
Farwell & Co.....	*227 00

Class No. 68. Glass:

Whittier, Fuller & Co...	39 00
W. F. Hyatt.....	*36 45
Austin P. Brown.....	55 25
Farwell & Co.....	62 50

Class No. 69. Brushes:

Whittier, Fuller & Co...	*461 10
W. F. Hyatt.....	514 28
Austin P. Brown.....	771 00
Farwell & Co.....	567 37

Class No. 70. Dry goods:

W. F. Hyatt.....	*379 00
Farwell & Co.....	420 00

* Accepted.

† Class not awarded.

Class No. 71. Stationery:	
William H. Dempsey	$452 15
William Ballantyne	*420 98
L. H. Bonestall	454 96
Class No. 72. Crucibles:	
W. F. Hyatt	*116 00
Farwell & Co	216 00
Class No. 73. Ship-chandlery:	
W. F. Hyatt	*423 10
Farwell & Co	622 65
Class No. 78. Leather:	
W. F. Hyatt	*141 00
Austin P. Brown	$270 00
Farwell & Co	225 00
Class No. 85. Anthracite coal:	
Sam'l G. French	3,744 00
David Babcock & Co	*3,184 00
Austin P. Brown	3,840 00
Farwell & Co	4,800 00
Class No. 87. Bituminous coal: †	
Sam'l G. French	2,690 00
David Babcock & Co	2,540 00
Austin P. Brown	2,500 00
Farwell & Co	2,625 00

Opened in presence of—
I. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk.*
B. T. HANLEY, *Clerk.*

NAVY DEPARTMENT,
BUREAU OF CONSTRUCTION AND REPAIR, *June* 8, 1875.

Offers to erect and complete, except armor-plating on sides, the United States double-turreted monitor Monadnock, at Mare Island, California.

	Erecting.	Completing.
Risdon Iron and Locomotive Works	$60,500 00	$308,000 00
Hope Iron Works	46,000 00	243,000 00
T. F. Rowland	.....	†325,000 00
Phineas Burgess	*22,350 00	*216,900 00

Opened in presence of—
I. HANSCOM, *Chief of Bureau.*
H. A. GOLDSBOROUGH, *Chief Clerk.*
B. T. HANLEY, *Clerk.*

NAVY DEPARTMENT,
BUREAU OF CONSTRUCTION AND REPAIR, *August* 30, 1875.

No. 11.

MARINE CORPS.

UNITED STATES MARINE CORPS, COMMANDANT'S OFFICE,
Washington, D. C., November 8, 1875.

SIR: I have the honor to report to the Department that no change of importance has been made during the past year in the duties or employment of the Marine Corps.

The general return for the present month shows that the ranks are at present nearly up to the number allowed by Congress, and as recruits have been offering very freely, we have been enabled by selection, and with-

*Accepted. † Class not awarded.

out expense for recruiting, to obtain rather a better class of men we have been receiving for some time past. About one-half the e force is on board vessels in commission, and the remainder is dist ted in about the usual proportions at the several shore-stations. A regular annual inspections of the several commands on shore, the ti were found in perfect order, and their equipment, drill, &c., such reflect credit upon themselves and the service. The duties with v they have been charged have been faithfully performed, and the ral conduct of the men, both on shore and at sea, has met the comn ation of the naval officers in command. The several barracks, wit public property in charge of the corps, were also found in good c tion, and will require nothing more than the ordinary attention and during the coming year to keep them so. As the naval station at I delphia will shortly be removed from its present site in that ci League Island, provision should be made for the erection of pe nent quarters for the marines at the latter place; and I would res fully commend the subject to the attention of the Department in ing its final arrangements for the transfer.

In submitting the annual report of the condition of the Marine C I have on several former occasions referred to the want of a larger of men at our more important naval stations; and as I am requir present such suggestions as I may deem the public interests requi connection with the corps, I again advert to this want of the se simply as an act of duty. At the navy-yards at Boston, New Philadelphia, Norfolk, and Mare Island, California, there should least double the force of marines that can now be furnished wit present limited number of men allowed by Congress. In this be am sure the naval commandants at those stations entirely concu am aware that the present financial depression throughout the co would seem to demand a reduction rather than an increase of publ penditures, yet I feel convinced the people of the country would no ject to the expense of five hundred additional privates, in order to this important branch of the naval service in its former state of u ness and efficiency.

The estimates for the support of the corps for the coming year, mitted by the disbursing-officers of the staff, have been carefully pared on the basis of existing laws, and vary but slightly in am from the appropriations for the present fiscal year.

I am, very respectfully, your obedient servant,

J. ZEILIN,
Brigadier-General and Commanda

Hon. GEORGE M. ROBESON,
Secretary of the Navy.

Estimates of appropriations required for the service of the fiscal year ending June 30, 1877, by the Quartermaster's Department, United States Marine Corps.

Detailed objects of expenditure, and explanations.	Total amount to be appropriated under each head of appropriation.	Amount appropriated for the current fiscal year ending June 30, 1876.
PROVISIONS.		
1,200 non-commissioned officers, musicians, privates, and washerwomen, 365 days, one ration per day, 438,545, at 23 cents per day, is	$100,740 00	$100,000 00
CLOTHING.		
2,000 non-commissioned officers, musicians, and privates, at $39.68 per annum, (actual cost per contracts 1874 and 1875,) is $79,360; and 1,000 watch-coats, at $9.51 each, is in all $88,870	88,870 00	100,000 00
FUEL.		
4,408 cords of wood, as follows: one brigadier-general, one colonel, two lieutenant-colonels, four majors, three staff-majors, twelve captains, two staff-captains, thirty first and second lieutenants, fourteen hundred non-commissioned officers, musicians, privates, and washerwomen, six hospitals, one armory, seven mess-rooms for officers, sixteen offices for commandant and staff and commanding officers at posts, eight rooms for officers of the day, ten guard-rooms at barracks and navy-yards, three clothing and other supply stores. One-fourth additional on 2,400 cords, quantity supposed to be required in latitude north 36 degrees from 1st October to 30th April, 600 cords, amounting in all to 4,408 cords, which, at $6.50 per cord, is	28,652 00	30,856 00
MILITARY STORES.		
Pay of mechanics, repair of arms, purchase of accouterments, ordnance stores, flags, drums, fifes, and other instruments	9,000 00	9,000 00
TRANSPORTATION AND RECRUITING.		
Transportation of troops, and for expenses of recruiting	5,000 00	5,000 00
REPAIR OF BARRACKS.		
Portsmouth, N. H., Boston, Mass., Brooklyn, N. Y., Philadelphia, Pa., Annapolis, Md., headquarters, Washington, D. C., navy-yard, Washington, D. C., Gosport, Va., Pensacola, Fla., Mare Island, Cal., and for rent of offices where there are no public buildings	15,000 00	10,000 00
HIRE OF QUARTERS.		
Hire of quarters for officers where there are no public buildings	16,000 00	16,000 00
FORAGE.		
Forage for public horses and the authorized number of officers' horses	6,000 00	5,000 00
CONTINGENCIES.		
For freight, ferriage, toll, cartage, purchase and repair of boats, per diem for constant labor, funeral expenses of marines, stationery, telegraphing, apprehension of deserters; oil, gas, candles; repair of gas and water fixtures; water-rent; barrack-furniture; furniture for Government houses and offices, packing-boxes, bed-sacks, wrapping-paper, oil-cloth, crash, rope, twine, carpenters' tools, tools for police purposes, purchase of fire-extinguishers, purchase and repair of hose, repair to public carry-all, purchase and repair of harness, purchase and repair of hand-carts and wheelbarrows, purchase and repair of cooking-stoves, ranges, &c.; stoves where there are no grates; gravel, &c., for parade-grounds, repair of pumps, and for other purposes	26,000 00	20,000 00

Respectfully submitted.

W. B. SLACK,
Quartermaster Marine Corps.

Estimates of appropriations required for the service of the fiscal year ending June 30, by the paymaster of the United States Marine Corps.

Detailed objects of expenditure and explanations.	Estimated amount which will be required for each detailed object of expenditure.	Amount appropriated for the cur-
PAY OF OFFICERS, NON-COMMISSIONED OFFICERS, MUSICIANS, PRIVATES, AND OTHERS OF THE UNITED STATES MARINE CORPS.		
1 brigadier-general, commandant	$5,500	
1 colonel	4,500	
2 lieutenant-colonels	8,000	
1 lieutenant-colonel, retired	3,000	
1 adjutant and inspector, 1 quartermaster, and 1 paymaster	10,500	
4 majors	13,750	
2 majors, retired, per act of June 30, 1834, (4 Stat. at L., p. 713, secs. 4, 5)	4,875	
20 captains, per act of March 2, 1847, (9 Stat. at L., p. 155, sec. 3)	46,800	
2 assistant quartermasters, per act of August 5, 1854, (10 Stat. at L., p. 556, sec. 1)	5,200	
1 assistant quartermaster, retired, per act of February 21, 1857, (11 Stat. at L., p. 163, sec. 1)	2,100	
4 captains, retired, per act of July 17, 1862, (12 Stat. at L., p. 594, sec. 2)	6,075	
30 first lieutenants, per act of June 30, 1864, (13 Stat. at L., p. 144, sec. 1)	53,250	
1 first lieutenant, retired, per act of March 3, 1865, (13 Stat. at L., p. 487, sec. 1)	1,125	
30 second lieutenants, per act of July 28, 1866, (14 Stat. at L., p. 334, sec. 13)	44,100	
2 second lieutenants, retired, per act of July 28, 1866, (14 Stat. at L., p. 337, sec. 37)	2,100	
1 leader of the band, per act of March 2, 1867, (14 Stat. at L., p. 422, sec. 1)	948	
1 apothecary, per act of March 2, 1867, (14 Stat. at L., p. 517, sec. 7)	750	
1 sergeant-major, 1 quartermaster-sergeant, and 1 drum-major, per act of July 15, 1870	1,080	
50 first sergeants, Navy Regulations	16,200	
140 sergeants, per act of July 18, 1816	31,560	
180 corporals	35,400	
30 musicians of the band	9,996	
96 drummers and fifers	17,736	
1,500 privates	270,000	
10 clerks and two messengers, (civil force)	10,000	
Payments to discharged soldiers for clothing undrawn	20,000	
Transportation of officers traveling without troops	5,000	
	629,545	$6[illegible]

J. C. CASH,
Paymaster United States Marine C

HEADQUARTERS MARINE CORPS,
Paymaster's Office, September 13, 1875.

These estimates exhibit an increase of $4,785 over the sum app ated for the present fiscal year, being for the pay of one first lieu placed on the retired list, and an addition of 10 per cent. to the officers for five years' service under the act of July 15, 1870.

I am, very respectfully, yours, &c.,

J. C. C.

SCHEDULE OF BIDS.

HEADQUARTERS MARINE CORPS,
QUARTERMASTER'S OFFICE,
Washington, D. C., December 8, 1875.

SIR: Inclosed please find copies of schedule of bids for fuel and rations submitted with estimates from this office 20th July last.

I am, sir, very respectfully, your obedient servant,

W. B. SLACK,
Quartermaster Marine Corps.

Hon. GEO. M. ROBESON,
Secretary of the Navy.

Abstract of offers received for furnishing fuel and rations to the United States Marine Corps, under the cognizance of the Quartermaster's Department.

[Offers for fuel under advertisement April 23, 1875.]

Stations.	Bidders.	Wood, per cord.	Coal, per ton.
Portsmouth, N. H	J. E. Walker & Co	$9 50	*$8 00
	Samuel G. French	10 90	8 90
	N. F. Mathes	*9 40	.....
Charlestown, Mass	C. A. Campbell	*8 87½	*7 68
	Samuel G. French	12 75	8 27
Brooklyn, N. Y	John O. Conway	8 25	.....
	Thomas Kelly	*7 77	6 97
	Samuel G. French	7 90	*6 83
Philadelphia, Pa	John O. Conway	8 25	.....
	Henry B. Wilson	8 90	.....
	Walter Reckless	8 00	.....
	William Jordan	8 00	*6 50
	James J. Convery	†7 45	7 95
	Samuel G. French	8 25	6 67
	James Ballenger	†6 50	.....
Washington, D. C	John McElroy	6 29	*6 95
	John O. Conway	8 00	.....
	Henry B. Wilson	7 75	.....
	Samuel Emery	6 47	7 23
	Johnston Brothers	5 82	7 00
	N. L. Fowler	5 99	7 20
	Henderson Fowler	5 89	7 40
	L. W. Guinand	†6 13	†6 74
	C. T. Yoder	6 07	7 07
	John S. Killman	6 37	7 37
	R. M. Miller & Son	*5 79	6 99
Gosport, Va	Peters Brothers	5 99	7 43
	R. J. Neely	*5 15	*7 00
	R. M. Miller & Son	6 79	7 49
Annapolis, Md	John O. Conway	7 00	.....
	N. L. Fowler	6 50	.....
	Henderson Fowler	6 39	.....
	R. M. Miller & Son	*6 39	.....
Pensacola, Fla	J. O'Neal	5 19	.....
	C. M. Pierce	5 19	.....
	George E. Wentworth	5 15	.....
	Hugh McHatton	*4 87	.....
Mare Island, Cal	James McCudder	12 00	.....
	A. Powell	*11 87½	23 50
	N. F. Mathes	13 00	.....

* Accepted. † Informal.

[Offers for rations under advertisement April 24, 1875.]

Stations.	Bidders.	Rations, per hundred.
Portsmouth, N. H.	Mallory & Co.	‡[illegible]
	H. W. Hall	27
	N. F. Mathes	‡[illegible]
Charlestown, Mass.	Mallory & Co.	‡[illegible]
	H. W. Hall	[illegible]
	Peter Higgins	‡[illegible]
Brooklyn, N. Y.	Mallory & Co.	22
	H. W. Hall	22
	John C. Gilbert	*19
Philadelphia, Pa.	Thomas Convery	21
	Mallory & Co.	‡[illegible]
	James J. Convery	22
	H. W. Hall	21
	Walter Reckless	*19
Washington, D. C.	Mallory & Co.	‡22 7
	H. W. Hall	18 3
	John C. Gilbert	*17 0
Gosport, Va.	Taylor & Loyall	24
	Mallory & Co.	‡22
	H. W. Hall	‡22
	Kimberly Brothers	22 7
Annapolis, Md.	H. W. Hall	*20 0
	John C. Gilbert	21 4
Mare Island, Cal.	J. E. Willotson	28 0
	H. W. Hall	28 0
	N. F. Mathes	*27
Pensacola, Fla.	J. O'Neal	31
	Hugh McHatton	25
	N. F. Mathes	*24

* Accepted. ‡ Withdrawn.

Respectfully submitted.

W. B. SLACK,
Quartermaster Marine Corps.

QUARTERMASTER'S OFFICE, *July* 20, 1875.

No. 12.

PANAMA INTEROCEANIC SHIP-CANAL.

REPORT OF COMMANDER E. P. LULL.

WASHINGTON, D. C., *November* 20, 1875.

SIR: I have the honor to present the following report of the operations of the United States surveying expedition lately employed in seeking a route for an interoceanic canal through the Isthmus of Panama.

The expedition was organized immediately upon the receipt of the following orders and instructions from the Department, viz:

NAVY DEPARTMENT,
Washington, D. C., December 29, 1874

SIR: Upon the request of the Interoceanic Canal Commission for more specific information in relation to the Isthmus of Panama, in general in the vicinity of the line railroad, you are detailed, and will proceed in the steamer of January 2, from New York for Aspinwall, with the party of officers ordered to report to you.

Your thorough experience in these matters relieves the Department from preparing minute and contingent instructions. You will, however, obtain specific information on the following points, viz:

1st. In relation to water-supply and the points whence it should be drawn for the interoceanic canal, if constructed upon the Isthmus of Panama.

2d. The difficulties that may exist from floods.

3d. Actual locations of the most practicable line or lines, with locations of locks, if the route, upon examination, should render this advisable.

4th. Observation as to whatever in the way of material or other conditions would look to the general question of construction, whether of advantage or disadvantage.

5th. To obtain in advance from the Panama Railroad Company whatever information as to levels, *known to be authentic*, the company may be disposed to give you, which may form a basis for your special careful instrumental examination.

6th. By the aid of a tug, and whatever other facilities may be necessary to enter the Chepo River, making such examinations of it as may be thought advisable after inspection. It is suggested, if the near approach of massive, solid ground on both sides of the Chepo should make it possible by dams to flood considerable areas and distances for slack-water navigation, that it might be found practicable in connection with a tunnel of considerable length to the Gulf of San Blas. If the prosecution of this examination should be found advisable, put it in such a shape as will not lead to doubts as to relative practicability.

If the short time given you to complete arrangements is insufficient, arrange to have shelter-tents, or whatever else is required, forwarded to you by the next steamer.

Paymaster F. H. Clark is assigned to your party, and a bill of credit is at Paymaster Cutter's office, drawn in your favor, for $3,000. It is supposed that an appropriation asked for will soon be passed for this work, when a further bill of credit will be sent to you, chargeable to that appropriation. If otherwise, your necessary expenses will be met in another way at an early day.

You are authorized to appoint a draughtsman at $150 per month, and an assistant at $50 per month, and, in general, to secure the services of such persons as may be necessary to the proper and speedy execution of this work, and you will keep the Department informed of its progress. You are also authorized to appoint a clerk.

Upon its completion you will return with your party, and if the rainy season interrupts your work to such a degree as to render it advisable to leave, you will do so without special instructions from the Department, and proceed to this city with such of your party as may be found useful in bringing up the work, and order the remainder to their homes.

Very respectfully, your obedient servant,

GEO. M. ROBESON,
Secretary of the Navy.

Commander E. P. LULL, U. S. N.,
Newport, R. I.

I arrived in New York in obedience to the above order on the morning of the 30th, meeting by appointment Civil Engineer A. G. Menocal, United States Navy, who was attached to the expedition as chief engineer. We at once set about procuring the outfit for the expedition.

The experience of former years having made us thoroughly acquainted with our needs, we met with no delay; and thanks to the kindness of the Department, the Bureaus of Navigation, and of Provisions and Clothing, in approving by telegraph requisitions for money, instruments, and provisions; to the facilities afforded by the Vice-Admiral commandant of New York station, and to the assistance rendered by Pay Director George F. Cutter, the purchasing pay-officer, we were enabled to sail January 5, (the mail-steamer having fortunately postponed her departure until that day,) with our outfit complete in every particular.

The following officers were attached to the expedition, viz: Commander Edward P. Lull, United States Navy, commanding; Civil Engineer A. G. Menocal, United States Navy, chief engineer; Lieut. Eugene H. C. Leutze, United States Navy; Lieut. H. G. O. Colby, United States Navy; Lieut. Edward W. Very, United States Navy; Lieut. Edward D. Taussig, United States Navy; Lieut. Jefferson F. Moser, United States Navy, (joined January 25;) Master John H. C. Coffin, United States Navy; Master Henry L. Greene, United States Navy; Assist. Surg. John F. Bransford, United States Navy; Assist. Paymaster Frank H. Clarke, United States Navy; Draughtsman James B. Philp; Commander's Clerk John E. Buck. Of these Messrs. Menocal, Leutze, and Moser were officers of large experience in this character of work, having served in several previous expeditions. Dr. Bransford and Mr. Buck had

served in one of the Nicaraguan expeditions. Five intelligent young men were engaged to serve as rodmen, polemen, and chainmen.

The expedition was provided with the following instruments, the greater part of which had been used in previous surveys, viz: Two transits, three spirit-levels, two gradienters, three sextants, one artificial horizon, two pocket aneroid barometers for measuring heights, one current-meter, three 100-foot chains, one 50-foot chain, three binocular field-glasses, three sets of drawing-instruments, together with the necessary field note-books, stationery, drawing-materials, &c.

The outfit consisted of 36 shelter-tents, made of light duck, waterproofed, 36 mosquito-bars, 18 knapsacks, 24 rubber blankets, 15 rubber pillows, 36 ship's hammocks, 36 canteens, 72 pairs of leggins, 100 pairs of shoes, 36 pots, pans, and spoons, 24 machetas, 6 axes, 6 hatchets, 6 camp-kettles, 6 frying-pans, 2 geologist's hammers, 4 lanterns, 2 dozen porcelain-lined iron plates, &c.

Of provisions there were only provided "soup and bouilli," tomato soup, sugar, coffee, and candles, and a small quantity of condensed milk, as the locality in which we were to work was near enough to the cities of Aspinwall and Panama to enable us to procure all other required articles from them.

The expedition sailed (with the exception of Lieutenant Moser, ordered to proceed in the following steamer,) January 5, 1875, in the Pacific Mail Steamship Acapulco from New York, and arrived in Aspinwall on the 14th of the same month. Through the courtesy of Mr. William Thompson, the superintendent of the Panama Railroad, there was put at our service, without cost, a store-room into which all the property of the expedition was placed until needed.

It was resolved to place two parties in the field, and these were organized at once.

Party No. 1 consisted of the following officers and others: Lieut. E. H. C. Leutze, commanding; Lieut. E. W. Very in charge of transit; Master J. H. Coffin, in charge of spirit-level; H. S. Fleming, rodman; Mancel Philp, chainman; Chas. A. Smith, poleman.

Party No. 2 consisted of: Lieut. H. G. O. Colby, commanding; Lieut. E. D. Taussig, in charge of transit; Master H. L. Greene, in charge of spirit-level; Clerk J. E. Buck to lead the line; J. H. Westerfield, chainman; Robert S. Burnett, rodman.

This arrangement continued until the arrival, on the 25th of the same month, of Mr. Moser, who immediately took charge of the level in Lieutenant Colby's party, and Mr. Greene was transferred to that of Lieutenant Leutze, where he was placed at the head of the line. The paymaster and draughtsman were stationed at Aspinwall, which was made a depot of supplies. This arrangement left the commanding officer, the chief engineer, and Dr. Bransford free to move from party to party, as occasion required.

THE PROBLEM.

It having been concluded, from our previous knowledge of the best profile obtainable across the Isthmus of Panama, that a slit cut from tide-water to tide-water, or, in other words, a canal without locks, was impracticable, at least in a commercial sense, and consequently that water for the canal must be drawn from some other source than the seas themselves, the question of water-supply became, as your instructions state, the first and most important point to be considered, for unless that could be satisfactorily solved, no other question need be considered at all. The requirements were an ample supply at the dry-

season of the year, and an ample escape for the superabundant ters at other times, which latter phase of the subject was quite as portant as the former. After fulfilling these conditions, the next part the problem was to obtain the most favorable location for the line, nbining the question of profile, distance, the avoidance of insurntable obstructions, and the debouchment into harbors or localities ere harbors could be built at cost within the limits of commercial cticability.

'he character of the excavation and the supply of materials for conction were important though subordinate questions.

s is well known, a railroad exists between the ports of Aspinwall or on, on the Caribbean, and Panama, on the Pacific. This road was t after a careful and exhaustive survey made by several eminent erican engineers, and doubtless its profile is the most favorable for ilroad that could be found. The surveys upon which the road was structed had developed a knowledge of the topography of that por- of the isthmus to a degree that saved us a vast deal of work which attended most other expeditions for the same purpose, viz, the ination of lines more or less promising, and which have to be exned at least far enough to demonstrate their impracticability. The rs, including many of the small mountain-streams, were located a upon the published maps and upon the plans in possession of the road company with a tolerable degree of accuracy, and the coast- on either side was well located upon marine charts. Mr. Thompson, superintendent of the road, and his successor, Mr. White, (who, by way, had been our fellow-passenger in the Acapulco,) kindly placed ur disposal all of the maps, plans, and profiles in their possession. y a glance at the map it will be seen that the general trend of the mus of Panama is east and west, the port of Panama lying almost theast of Aspinwall. The river Chagres takes its rise somewhere in vicinity of San Blas, (its exact source is not known,) flows in a genly west-southwest direction until it reaches the village of Matachin, r which it turns to the northwest and flows in a tortuous course to Caribbean, its mouth being some seven miles from Aspinwall. This r is the only source from which an adequate supply of water can be ained for a canal, and indeed it was much doubted by most persons iliar with it whether in the dry season even that source could be deded upon. To this river, then, or nowhere were we to look for the tion of the first point of our problem.

he question of the termini had next to be looked to. The bay of inwall, or Navy Bay as it is called upon the old charts, although exed to northers, which are fortunately rare upon the coast, is a harbor onably secure from the prevailing northeast trade-winds. It is very modious, and could easily be rendered entirely safe in all weathers. here is no harbor within accessible distance to the westward of Asvall or any chance of constructing one without enormous cost. The ith of the Chagres can only be entered by coasters of the smallest s. To the eastward, and distant some eighteen miles from Aspin-, there is the beautiful harbor of Porto Bello. Our choice for an antic terminus lay between these two harbors, and the reasons which ded us upon which one to choose will be given further on. On the ific we had the great bay of Panama into which to debouch at any it where it should prove most advantageous.

1843 a plan was published by Mons. Garrella, a French engineer a canal across the isthmus, and which is thus described by Rear-Ad-

miral Davis in his report to Congress on the subject of interocean canals, 1866:

This route was selected only after a careful inspection of the intervening space, a after making the requisite levelings. It will be seen by this map that he follows t valleys of Bernardino and Caimito on the southern descent, and those of Inebrado a Chagres on the northern. The mountainous region approaches very near the Paci and its highest elevation is 459 feet above the level of the sea. He tunnels the mou ain at about 99 meters (324 feet 9 inches) below its highest point; and he establish his summit-level for a distance of 25,361 feet at an elevation of 135 feet above hig water from the Pacific Ocean. From this summit-level he descends to the Paci Ocean by means of seventeen locks, some of which are necessarily very much crowde On the other side he descends to the Atlantic by eighteen locks, which, owing to t more gradual descent on the north, are more conveniently spaced.

It is remarked by the commissioners of the "ponts et chaussées," appointed to r port on Mr. Garrella's project, that his mode of proceeding is reasonable, and entire in conformity with the rules of art.

A glance at the plan and profile shows that the near approach of the chain of t Andes to the Pacific Ocean obliges him to pursue the course he has adopted. Of t whole length of the summit-level, 17,550 feet are subterranean; and, as the commi sion observes, this is not only inconvenient to vessels, but it involves great expens since the tunnel must be sufficiently high to allow vessels to pass through with the lower masts, at least, standing.

The means of feeding the canal are not satisfactorily stated. The river Chagres w gauged, it is true, at Cruces and at Gorgona, but the river is to be tapped above the points. Provision is also made for an auxiliary reservoir; still, the commission is n satisfied on this question.

The harbors which form the termini of the canal are, on the Atlantic side, Nav Bay, and on the Pacific side the bay of Vaca del Monte.

Garrella proposed to use the bed of the Chagres for a portion of tl distance; and in order to reduce his profile, proposed to occupy tl valleys of small streams without making provisions for the waters these streams except by receiving them into the canal. His plan w based upon very limited knowledge of the topography of the countr and, in the light of our present information, has not a feature wor considering.

Much more recently, during or after the construction of the railroa plans and estimates were made by Colonel Totten, the distinguish chief engineer of the road, for a canal to be located in the vicinity the road itself, and drawing its waters from the Chagres by means o feeder. Colonel Totten's estimates were furnished me by Commodo Ammen, chief of the Bureau of Navigation, and also by Prof. J. Nourse, United States Navy. No maps or profiles, however, could obtained showing the exact location. A few pencil lines upon one the maps lent us by the superintendent of the road, were supposed him to indicate Colonel Totten's line; but as our own subsequent loc tion differed from it very materially, I was led to doubt whether tl was the case. Nor have I been able to ascertain whether Colonel Tott actually made a survey for the canal route, or whether this estima was made upon his knowledge of the topography obtained during t survey of the road. In the absence of this information, we were oblig to locate our line altogether for ourselves, as much so as if no plan h ever been proposed by him.

PRELIMINARY RECONNAISSANCE.

January 16, Mr. Menocal and myself, taking with us maps and profil passed over the line of the railroad on a general reconnaissance, wit view of acquiring such information as we could before laying out t work of the expedition.

By examining numerous high-water marks, we found that the ri Chagres, at that time at its low stage, was subject to freshets wh

elevated its surface not less, in extreme cases, than 40 feet. All idea, therefore, of making a combined use of its bed and of independent canal for ship navigation as proposed by Mr. Garrella, had to be abandoned at once, particularly in view of the great suddenness of these freshets.

We had already decided that the Atlantic terminus must be to the eastward of the mouth of the Chagres; this involved the necessity of the canal's crossing the river, and one of the main objects of our reconnaissance was to determine approximately where the crossing should be. As the enormous variation in the amount of the river flow precluded the possibility of receiving its waters directly into the canal, an aqueduct—or probably a better term would be viaduct—had to be provided for, through culverts under which, the waters of the river should pass. The culverts must be made of sufficient dimensions to pass the water at its highest stage. A brief computation showed what must be the difference of level between the surface of the water in the proposed viaduct and the surface of the river at its then stage, thus:

	Feet.
For rise of river	35
Spring of arch of culvert	15
Thickness of wall over crown of arch	6
Depth of water in viaduct	26
Total	82

The summit elevation of the canal could, therefore, not be less than 82 feet above that of the river at the point of crossing, computing from the lowest stage of the water in the river. All references to the level of the river surface will hereafter refer to that stage, unless otherwise specified.

By referring to the profile of the railroad we found that the river at the great bend near Matachin and just above the confluence with the river Obispo, was approximately 42 feet above mean half-tide of either sea; this added to the 82 feet would make, should that point be chosen for the crossing, 124 feet as the summit level of the canal. An elevation of 124 feet would involve at least twelve lift-locks on either side, or twenty-four in all. This we regarded as the greatest number admissible, particularly in comparing the line with that through Nicaragua, where only ten of a side were required. This decided us that we could not go any higher up the river, or in other words that the line, at least at the point of crossing, could not be carried any farther to the eastward. A direct line drawn from Porto Bello to Panama would pass considerably to the eastward of this point, and a line drawn from this point to Porto Bello would be several miles longer than one drawn to Navy Bay or Aspinwall. In addition to this argument in favor of the selection of Aspinwall, was the unmistakable evidence that a much higher profile would be found in the direction of Porto Bello, which existed in the fact that the Chagres received numerous not inconsiderable tributaries from that direction, and known to take their rise far to the eastward.

This locality presented some other features favorable for a point of crossing, mainly in the conformation of the ground on either side. The profile of the cross-section showed good abutments for the ends of the viaducts and at the same time ample room in the valley of the stream for the construction of culverts for the escape of the river-flow. The exact point was of course not chosen until several cross-sections had been taken, but the immediate vicinity of the bend was determined

upon at the first reconnaissance as the place in which to seek fc The bend is on the Atlantic slope of the Cordillera, and, on the lin the railroad, is but six miles from the dividing summit.

Passing the divide we found the descent of the Pacific slope q rapid, and by examining the profile of the railroad it appeared that a summit-level of 124 feet we should have a deep cut of but little r than five miles in length, even if we could not improve on that pr which we hoped to do. A lower summit-level would, of course, incr the length of the deep cut, which consideration added to our determ tion not to seek a lower point of the river for crossing.

Having completed our preliminary examination, we proceeded to ama to make arrangements for procuring laborers to act as *macheter* choppers, and some supplies. Calling upon an old personal friend o own, Mr. Henry Lewis, we were by him introduced to Messrs. Dellat & Co., resident merchants, whose kind offices he solicited for us. T gentlemen, both in a business way and through personal attentio two members of the house, Mr. Dellatorre and Don Geraldo Lewis, i itated us in every manner in their power during the whole time of stay upon the Isthmus, and put us under many lasting obligations.

I also took occasion to call upon Dr. Long, the United States co to ask him to notify the President of Panama of the arrival of th pedition, and to ask the President to appoint a day when I could upon him and pay my respects.

On the following Monday, January 18, I called upon the Presi with the consul, and explained briefly my instructions. The Presi expressed himself very much pleased with the object of the expedi and the interest of the United States in prosecuting the work, offered us every facility in our labors. This offer he afterward r good by directing the alcaldes of the various districts through w we were to pass to aid us in any manner in their power. We ha occasion, however, to avail ourselves of their assistance.

In the mean time Lieutenants Leutze and Colby were completing organizations of their parties, issuing instruments, outfits, &c., and officers in charge of the transits and levels were employed in adju their instruments, and in running a few trial-lines to drill their a ants, &c. Four days were thus spent, making each person ent familiar with his work.

BEGINNING OF OPERATIONS.

January 20, having procured through Messrs. Dellatorre & Co necessary number of macheteros, I proceeded with them to Mata where I was met, by previous arrangement, by Messrs. Leutze Colby, with their parties, camp-equipments, &c. A camp was fo in common by the two parties, on the bank of the Chagres, about a above Matachin, near where we proposed to begin work. The enc ment was called "Camp Ammen," in honor of the Chief of the Bu of Navigation, for the great interest taken by him in the interoc canal question, and the assistance he had rendered to the various ditions employed in attempting its solution.

To each party were now attached, in addition to the officers an sistants already mentioned, one cook, one servant, and nine machet this having been found by our experience in former expeditions t the minimum number consistent with efficiency. A whole day wa voted to the construction of the first camp, in order to thoroughl struct those persons who had not served before; good shelter at r

and a comfortable place in which to sleep being very important elements in the preservation of health, and, consequently, of efficiency. It was wonderful how expert each officer and man afterward, and very soon, became in erecting tents, &c. A ridge-pole and two side-poles, supported on forked stakes, properly braced, and the whole tied together with the tough flexible vines which abound throughout the region, formed the frame-work over which a shelter-tent was stretched, usually large enough to accommodate four persons. For a sleeping arrangement, each person was supplied with a ship's hammock, to each side of which was attached a stout pole; between the ends of the side-poles, short pieces called spreaders were secured to hold the hammock out flat or nearly so; four forked stakes of convenient height driven into the ground supported the whole. A mosquito-bar, an India-rubber blanket and pillow, and a pair of woolen blankets, completed the affair, and an exceedingly comfortable bed it made. As was the case in Nicaragua, we seldom found a night, while in the interior, when it was warm enough to sleep without blankets. The natives—employed as macheteros—generally preferred rolling themselves up in their blankets, and sleeping upon the ground, to taking any trouble in preparing a bed.

After a thorough local reconnaissance, conducted by Mr. Menocal, cross-sections were taken, and the exact site of the viaduct selected. The stream was gauged at the same time, using a delicate current-meter for testing the velocities at different points in the cross-section. The daily discharge was found to be 87,350,400 cubic feet.

It was then decided that Lieutenant Leutze, with party No. 1, should locate the feeder. For this purpose, he was instructed to run the traverse and levels up the river Chagres, following its bed until he should find an elevation, at the surface of the water above the water-surface at the site of the viaduct, of 87 feet plus 1 foot for each mile of distance from the starting-point, or until he should find a good location for a dam, by which the waters could be raised to that elevation. If this last could be done, as it was hoped and afterward shown that it could be, it would of course materially diminish the length of the feeder. It might here be explained that the valley of the river is inclosed on either side by numerous ranges of hills, sometimes approaching the river-banks and again receding from it.

At the site of the proposed viaduct the valley is so narrow that the length of the viaduct would require to be but 1,600 feet; an equally favorable location for the dam was the object of Mr. Leutze's search. On succeeding in this, he was to return on a grade-line, if possible, until he should intersect the line of the canal itself, striving to make the shortest distance consistent with the retention of the grade, which was to begin at the level to which it was proposed to raise the water-surface of the river, and to descend gradually until the proposed level of the canal was reached at the intersection.

To Lieutenant Colby and his party was assigned the work of locating the canal between the end of the viaduct and Panama Bay.

As it could not be told what difficulties would be met with by either party, it could not be predicted which would finish first the work now in hand; the division of what remained was, therefore, left for future consideration.

In planning the work, as in all other matters relating to the survey, Mr. Menocal was freely consulted, and his advice as freely taken, always to the securing of the best results in the obtaining of information with the most economical expenditure of time and labor.

As a test of the accuracy of the levelers, upon whose work so much

depended, before starting upon the main lines, each was required to r a line from the water's edge, at the site of the viaduct, establishing initial bench-mark, to the railroad-track near Matachin, a distance about a mile, and to return to the starting-point. Their results diffe r by less than two-tenths of an inch from each other and from coincide r with the level of the bench.

One or two mishaps occurred at the outset, such as the breaking o f tripod and the bending of a vernier-arm, each of which caused a li t delay, but by the end of three or four days the parties were fa ir under way and making good progress.

Lieutenant Leutze's party followed the bed of the river generally, b cutting off the bends whenever possible, in order to shorten the distanc This involved crossing the stream very often. The current in man places was quite strong, with occasional rapids. The water varied i depth from a few inches to 15 and 20 feet, making it very laborious fo the party. Much greater progress could be made in the river, how ever, than by cutting a trail on shore, and for that reason it was followe After one or two days' work, the party began to accomplish from 10,00 to 12,000 feet per day.

Lieutenant Colby's party started on a general compass-course of sout 29° east, toward a point which had been chosen for crossing the divide with directions to make the best profile possible; in other words, t follow a line which could give the least depth of excavation except whe to do so would so greatly increase the distance as to counterbalance o more than counterbalance the gain, to adjust which points often require the greatest judgment and care.

After passing the ridge of high ground immediately adjacent to th river, and upon which the viaduct was to abut, the line fell into a valle where the ground was found very much below the level proposed fo the viaduct. We had determined, for reasons already given, to mak this the summit-level of the canal, and consequently to carry it throug the divide until it intersected the surface on the opposite, or Pacifi slope. It therefore seemed as if a considerable detour to the left woul have to be made to keep on the grade-line, or else that the low lan would have to be crossed by means of a second viaduct. After som further examination in various directions, it was found that they wer in a valley opening to the right, but toward the left ascending until i was finally lost at the junction of the two ridges which formed it. Con tinuing the line 1,970 feet, the grade-level was again reached. I should here be explained that the line was running through a dens forest, with the usual interlacing of vines, undergrowth, &c., a tra having to be cleared with the machetas for every rod of advance, so tha it was seldom that the eye could penetrate a dozen yards in any directio

It was only, therefore, by the laborious process of running trail-line in various directions, cutting one's way through the jungle, that an idea of the immediate conformation of the ground could be obtaine These reconnaissances were made with the pocket aneroid barometer and with pocket-compasses. Each officer was supplied with a heav sheath-knife, without the vigorous use of which it was frequently im possible to move at all, so intricate is the net-work of tough flexib vines; a tree of considerable size, when cut down, will often be kept fro falling by being attached to others by these vines, to the no small a noyance of the chopper.

After obtaining a knowledge of the formation of the valley abo spoken of, Mr. Menocal proposed as a substitute for the viaduct acro it, to inclose it with a dike on one side, making a basin of 22 acres

extent; later, lines of levels were run for the location of the dike, which will be found estimated for. By this ingenious device, what seemed at first an obstacle which it would be very expensive to overcome, would be converted at moderate cost into a very desirable inland harbor.

This is but one of the numerous instances, both here and in the Nicaragua line, where the judgment, the engineering skill, and the untiring energy of Mr. Menocal have found remedies for our greatest apparent difficulties.

As has been said, the party was following in general a compass-course. Frequent reconnaissances had to be made to insure preserving the best profile, and deflections were made from the general course whenever it seemed advantageous. Several offsets a day were made to the right and to the left, for greater or less distances, to give as much as possible of the contours of the ground; the former were generally extended to the railroad-track. The reconnaissances were generally made by the chief of the party, accompanied by the chief engineer or the commanding officer, when present. With every precaution, it was occasionally found that the line was running into ground so unfavorable that it was necessary to go back for a distance and make a fresh start in a new direction.

By January 29, each party had extended its line so far that it was necessary to move camp. Striking tents, Mr. Leutze, by means of canoes, proceeded some eight miles up the river, and established his party at "Camp Marguerita." The canoes being deeply laden, were forced up with considerable difficulty against the strong current in the various rapids. Mr. Leutze had acquired great skill in handling boats under similar circumstances, during the Nicaragua expeditions, and succeeded in rapidly overcoming these difficulties, as he usually did in cases requiring the exercise of will, good judgment, and muscular force. Camp Marguerita was located some distance in advance of the head of the line, this being our invariable custom in moving camp, so that each of the next two or three days' work should bring the party at night nearer and nearer to their temporary home; then, passing it, a few days' further advance would make another move necessary.

Through the courtesy of Superintendent White, there was placed at the disposal of Mr. Colby and party, at Empire station, an unoccupied dwelling belonging to the railroad company. One of these exists at each four miles of road, having been formerly occupied by track-masters, now discontinued. Empire being at a convenient distance from the end of Mr. Colby's line, and the station-house having ample room to lodge his whole party, he was saved the time and trouble of erecting his tents. The moving was accomplished by means of canoes to Matachin, and thence by rail to Empire.

On the 4th of February, both parties progressing favorably, Mr. Menocal and myself went to Panama to make such examination as was necessary to determine at what point the line could advantageously debouch into the Bay of Panama. There is a good chart of the bay upon surveys made by English officers, and with that, and by making such soundings as we found necessary, we finally concluded that the most suitable point for debouchment would be about one-quarter of a mile to the eastward of the railroad company's wharf, and some mile and a half east of the city of Panama. The chief advantages of this point are, the easy approach from the point of crossing the divide; the proximity of deep water to the shore; the remoteness of any river-mouth to discharge detritus, and thus form obstructions; and the existence of a straight channel out to deep water, and not obstructed by reefs. We were indebted for some valuable information to Capt. John M. Dow, of the Pa-

cific Mail Steamship Company, an accomplished navigator, and naturalist as well, and who, in the pursuit of both these callings for many years in the vicinity, has gained a most thorough knowledge of the hydrography of the Bay of Panama.

February 4, Lieutenant Leutze's traverse had advanced so far up the river that he was again obliged to move camp some seven miles. Each move was found to be more troublesome than the last, the current of the stream becoming stronger and the rapids more frequent.

About three miles above the site of the first camp, is the village Cruces, now containing some three or four hundred inhabitants. It is very old, having been built by the early Spanish occupants of the land. Notwithstanding its proximity to Matachin, the nearest railroad-station, it has to that point no sign of a road, all communication being by water. Above Cruces, at least as far as our line extended, there are only here and there a few huts, and scarcely a vestige of cultivated ground. Very little could be purchased in the way of provisions, except milk, eggs, and occasionally a chicken, and these not always. Nearly everything in the shape of supplies had to be forwarded from Panama or Aspinwall.

By February 9, Lieutenant Leutze's line had reached a point on the river which he regarded as suitable for the erection of a dam; and Lieutenant Colby's party was in close proximity to the divide. Mr. Menocal proceeded to join Mr. Leutze to aid in the selection of the exact location of the dam, and to procure such local information as was needed. On the same day, Lieutenant Very, in attempting to pass one of the rapids, was swept away by the powerful current, losing his transit-book, which involved the necessity of going back and retaking the lost angles. Fortunately, all the station-marks had been preserved.

Thorough local reconnaissances were made during the next two or three days by Messrs. Leutze and Menocal. Cross-sections of the river and its immediate valley, and gauges of the stream, were taken. A capital site was chosen for the dam, a solid rock foundation and precipitous rocky banks for abutments on either side. The next object to be sought was a good starting-point for the feeder, which the immediate vicinity of the dam did not offer. The general character of the valley showed that the best location could be obtained on the left, *i. e.*, the southern bank. Nearly the whole of the 11th was spent in seeking a break in the wall of the rock forming the bank, but without success. On the 12th, at a distance of 4,800 feet from the site of the dam, an eligible spot was found. The traverse in ascending had taken so sharp a curve around the southward and westward (Lieutenant Very having extended the survey up to that point) that the initial point of the feeder was really nearer to the main line of the canal than the site of the dam.

Lieutenant Leutze and party now began their return on the grade line. So devious were the contours of the surface that a great deal of care and good judgment had to be exercised, reconnoitering constantly ahead, the problem made much the more troublesome, as has been explained, referring to Lieutenant Colby's line, from the fact that so little could be seen at a time. Generally at the end of each day's work an offset was cut to the river-bank, checking the work and saving long distances in returning to camp, and in gaining the line the following morning. It was a never-ending source of astonishment to the natives that the officers could start from a point in the dense forest and lead them so directly to the river-bank, and even directly to the camps when the distance was not too great.

In the mean time Lieutenant Colby with his party, accompanied by myself, was carrying his line across the divide. The railroad in pas-

ing the summit makes a sharp curve around a hill, or between two hills, by which location a comparatively low pass was obtained; the curve was, however, of too small radius for a ship-canal. To avoid this our line was carried across a somewhat higher ridge, though still through a considerable depression. To compensate for the increased height was a considerably decreased distance.

On the evening of the 9th, young Mr. Westerfield, the chainman, was taken down with quite a sharp attack of fever, having overtasked his strength. On the following day Dr. Bransford joined the party, having left Mr. Leutze's camp the day before. His arrival was very opportune, for a few hours afterward an old negro employed as cook was seized with a congestive chill, of which he died within twenty-four hours, notwithstanding the utmost exertion on the part of the doctor. The poor old fellow had, by his manner of living, completely exhausted his vital forces, and did not rally in the least from the moment he was attacked; the strongest mustard-plasters placed on his wrists and kept there until he was dead failed to produce the least inflammation. Dr. Bransford had shown himself, during the Nicaragua expedition, to be a master in the management of malarious attacks, and although we had two or three quite obstinate cases during our present expedition, this was the only one which failed to yield to his treatment. Young Westerfield was thoroughly well in a few days.

The divide was actually crossed on the 12th and the descent to the Pacific begun. A new compass-course was taken and followed, as before, as nearly as the conformation would admit of its being done. A good deal of trouble was experienced, in both parties, with the natives employed as macheteros, many of whom proved very worthless, feigning sickness, &c.; but by a judicious sifting process each party soon secured a good set of men, who continued to serve till the end of the survey.

February 16, Mr. Menocal came to Lieutenant Colby's party, and I proceeded to that of Lieutenant Leutze, in order that each might see the important portions of the work that the two parties had just completed. Lieutenant Leutze having made some little progress, on his return had shifted his encampment down the river and established "Camp Sunnyside."

As I arrived in camp, one of the men, in attempting to open a box, cut his arm very badly with a hatchet. The doctor being with the other party at the Empire station, Mr. Leutze and myself did all in our power to check the profuse bleeding of the wound; but finding our success was only temporary, we were finally obliged to put the man into a canoe, in charge of Mr. Greene, who carried him down the river to Matachin, and thence by a hand-car to Empire. This determined me to make application for a second medical officer, in order that one might be present with each party, which I did by the next mail. The Department sent to us Dr. Chiola, who arrived by return steamer.

Both parties were now making favorable progress; Mr. Leutze unfortunately suffering from occasional attacks of fever, but refusing to give himself sufficient rest to recover from it. He had contracted the fever by overwork and exposure in the Nicaragua expedition, and really ought not to have joined a new survey, but that his zeal overmastered his prudence.

On the 17th, Mr. Colby was taken down with the fever, having also considerably overtasked his strength; the labor for the chiefs of the parties being necessarily very severe, and neither sparing himself in the least. A couple of days under Dr. Bransford's care brought Mr. Colby around, though he was not actually fit for duty for several days,

and commenced work much sooner than he ought, but fortunately harm resulted from it.

On the 18th the doctor, with the cooks, shifted camp to Rio Gran station, eight miles from Empire, where another of the track-maste cottages was put at the disposal of the party.

Lieutenant Taussig continuing the survey with the remainder of t party, no time was lost in the operation of moving. This party op ating in the valley of the Rio Grande, a dirty stream emptying into t Bay of Panama, some two miles west of the city, and was making exc lent progress toward the debouchment, the line crossing the strea frequently and running through swampy ground.

February 19, Lieutenant Taussig was taken with the fever, sufferi one of the severest and most obstinate attacks that was experienced any of the party. Mr. Menocal being present, took charge of the tra sit and Lieutenant Moser of the line, so that the work was kept goi

February 24, the line was extended to the beach, at the point alrea chosen for the entrance into Panama Bay.

On the following day the camp was shifted to Obispo station, ne Matachin, preparatory to making the detailed local examination for t artificial basin already spoken of. A couple of days were then given officers and men for a much-needed rest.

On consultation with Mr. Menocal it was now determined to reser for Lieutenant Leutze's party the section of the Atlantic division betwee the viaduct and Barbacoas, about twenty-one miles from Aspinwall, an to give to Mr. Colby's party from Barbacoas to Aspinwall.

By March 1, Mr. Colby's party had completed the detailed survey the site of the basin, and had shifted camp to Frijoles, near the initi point of their new line. On the following day they established benc and station marks, and began their line.

In Mr. Leutze's party the work of locating the feeder was being pros ecuted with varying success. On the 23d of February the valley of th Chilibri, a tributary of the Chagres, was reached; here the level sud denly dropped to 22 feet below the grade line. The valley was foun to be some 3,000 feet wide. Two or three days were spent in trying t find a point, by ascending the stream, where the valley was enough nar rower to compensate for the increased distance in reaching the point, but without success. Camp was shifted on the 24th to a position just below the mouth of the Chilibri, and called Camp Hunter.

In making the reconnaissances a clearing was found on the top of a hill overlooking the valley for miles up. Lieutenant Very climbed to the roof of a hut in the center of the clearing, from which he was able to get an excellent idea of the general topography. This was one of the few spots found during the whole survey offering any such advantage, trial lines being as a general rule our only guides in cases of doubt. The low level of the valley was a serious obstacle, as the water would have to be carried across it either by an aqueduct, or else by inverted siphons. It seeming to be inevitable, Mr. Leutze had no alternative but to cross it at the narrowest place, without deflecting his line in any great degree, and to continue.

March 26, Mr. Coffin was sent to Mr. Colby's for treatment for an ab scess, Mr. Greene taking charge of the level.

On the 1st of March, joining Mr. Leutze myself, (a slight touch o fever having prevented my doing so before,) we turned back to th Chilibri again in order to exhaust the subject thoroughly before givin up the attempt to avoid the low ground, or at least to diminish th

length of the crossing. Three days were spent in the effort, which was finally abandoned as impossible.

Mr. Leutze now resumed the grade, following it as nearly as possible. On the 10th he shifted his party to Camp Ammen, which he re-established. On the 11th, Acting Assistant Surgeon T. Chiola, U. S. N., having arrived on the 9th and reported for duty, was assigned to Mr. Leutze's party. Mr. Leutze, being sadly in need of medical treatment, went the same day to Mr. Colby's camp to place himself in Dr. Bransford's hands, remaining for two or three days.

March 15, Mr. Leutze brought the line of the feeder to an intersection with the line of the canal, debouching into the proposed artificial basin. Gauging the flow of the Chagres, he found the discharge to be 647 cubic feet per second—a considerable diminution since January 23, owing to the advance of the dry season.

On the following day the survey of the main line from the viaduct to the initial point of Mr. Colby's line was begun. The distance to be made was, in a straight line, but about eight miles, but was through rough and broken country, requiring exceedingly careful examination.

The other party were in the mean time making very good progress seeking the shortest distance consistent with a good profile; the usual number of reconnaissances, offsets, trial lines, &c., being made to secure that end. On the 10th of March camp was shifted to the residence at Bohio station, which, except for the lack of good water, was one of the most comfortable locations thus far occupied.

Mr. Menocal and myself, with Dr. Bransford and Paymaster Clark, now prepared to make the reconnaissance of the Bayano or Chepo River, required by your instructions. For this purpose, through the assistance of Mr. Theodore J. DeSabla, a merchant of Panama, and formerly United States vice-consul for that port, a small schooner was procured, the only means of transportation available. The schooner was the property of Dr. Kratochvil, a gentleman who had spent a fortune some years before in the establishment of a sugar-estate about twenty miles up the Bayano, and which, owing to the lack of laborers, he had been obliged to stop operating. His little vessel was now running between his place and Panama with dye and furniture woods, and also with wood for fuel.

Embarking the evening of the 15th of March, we reached the mouth of the Bayano on the following morning. Getting into an anchorage just at the last of the flood, we were obliged to come to and wait for the next flood before proceeding up the river. We took occasion to make such soundings as we needed inside the bar. There is a village of some twenty cane huts at the mouth of the river, called Boca del Bayano. At the turn of the tide we got under way and proceeded up the river some six miles, sounding as we went. We then dropped anchor till daylight; got under way again and carried our soundings ten miles farther up, when the tide again turned ebb, and the schooner was obliged to come to. We now took a wretched little canoe and in her continued on three miles farther, to the estate of Dr. Kratochvil.

We were very hospitably received by the doctor, who gave us pleasant quarters and regaled us with all that his place afforded—abundance of fruit and vegetables, and, what was quite a new experience for each of us, with the flesh of the tapir, which we found very delicate and palatable.

It was a sad sight to see so magnificent a place, with fine buildings, abundant machinery, and other facilities, lying idle and going to ruin for want of hands to work it. Notwithstanding the lack of laborers for the cane-field, there were quite a large number of retainers about

the place, wood-cutters, gardeners, India-rubber hunters, &c., all more or less dependent upon the doctor, and, surrounded by them and their families, and his own children, with a large library, and enough to live comfortably upon, he seemed to be very well contented with his lot, and although regretting the failure of his great enterprise, did not let it make him unhappy.

We passed the remainder of the day of our arrival and all of the following in collecting such further information as was required. Mr. Menocal and myself went in a canoe some miles farther up the river. Thus far we found no point where a dam could be built, the banks being low and swampy. Occasionally high ground approached one bank or the other, but never on both sides at once. The banks were alluvial, except in the few cases already mentioned, and these were not met within fifteen miles of the mouth. Our soundings had shown from 25 to 30 feet of water in the channel for the first three miles from the mouth, then frequent bars with 10 feet, 8 feet, and finally not more than 4 feet, these growing more and more frequent and longer as we ascended the river. Just above Dr. Kratochvil's place we found a solid gravel bar some three-quarters of a mile in length, with scarcely water enough to float a canoe. Most of the others were composed mainly of mud, which is also deposited in large outlying flats off the mouth of the river. A strong tidal current at all times, and overwhelming floods during the rainy season, would render abortive any attempt to dredge a channel in this stream, while up to the highest point visited by us, as said above, no location existed for a dam, by which to produce slack-water navigation. We concluded that further examination, except at the river mouth, was unnecessary.

Desiring to know a little more of the harbor-bar, Mr. Menocal, Dr. Bransford, and myself, bidding good-bye to our hospitable host, Dr. Kratochvil, started in a canoe, at 3.30 on the morning of the 19th, for Boca del Bayano, which we wanted to reach by 8 o'clock, (when the tide would be at the lowest, and also to take advantage of the usual morning calm.) This, by the help of the ebb and by vigorous paddling, we accomplished. A very disagreeable trip it was, too, in the chill night-air. The banks of the river, left dripping and slimy by the falling tide, added to the unpleasant effect. The doctor administered to each of us and took himself a five-grain dose of quinine to ward off fever, which he thought we stood a good chance of contracting.

Arrived at the village of Boca del Bayano we set up a tide-gauge, which the doctor took charge of. Mr. Menocal and myself procured some fresh hands for our canoe and went out to the bar to sound. A pull of two hours against the incoming tide brought us to the bar, upon which we found a depth of but 12 feet, (reducing to low water.) The mud-flats, already spoken of, extended for several miles in each direction. The bar, which is said to be a shifting one, (as is altogether probable from its character,) lay at the time of our visit near the island of Chepillo, and about two miles from the mouth proper of the river.

Turning back we encountered the land-breeze, now quite brisk, and a little toppling sea made by its opposition to the incoming tide. Our pull back to the beach consumed another two hours. We were drenched to the skin before we landed, and hungry enough not to criticise the breakfast prepared for us by the wife of the alcalde. We had not had time to breakfast before starting for the bar.

Toward evening Paymaster Clark joined us with the schooner, and we embarked for Panama, where we arrived at midnight on the 20th.

Regarding the route from the mouth of the Bayano to the Gulf of

San Blas, two careful surveys, one under the auspices of Mr. Frederick W. Kelley and others, of New York, in 1864, and one by the expedition under Commander T. O. Selfridge, U. S. N., in 1870–'71, have shown that between the Gulf of San Blas and the Pacific slope of the Cordillera a tunnel will be required of not less than seven miles in extent for a thorough cut. By using a higher summit-level, *i. e.*, resorting to locks, the length of the tunnel might be somewhat reduced, possibly to six miles, and still have feed-water, though this is by no means certain. The cost of a tunnel of suitable cross-sections, with masonry-arch, and of one mile in length, Mr. Menocal computes to be not less than $15,000,000, while for greater lengths the cost would be increased in a very rapid ratio, owing to the distance it would be necessary to transport material excavated and that used in construction. It is not, in my opinion, safe to estimate for self-sustaining rock in a projected tunnel of so large dimensions, for, although it might prove to be so, there is no means of ascertaining the fact beforehand, and the chances are, to say the least, as much against as for it. A tunnel of even five miles in length would thus cost between $80,000,000 and $100,000,000. The Bayano river cannot be utilized, and an independent canal would have to be built from the end of the tunnel to the sea. The line possesses but two good features, one the magnificent harbor afforded by the Gulf of San Blas, the other the short distance from sea to sea, in a direct line but thirty miles. These, however, compensate but slightly for the enormous disadvantages. The line bears no comparison with either the Nicaragua route or that of Panama as developed.

On our return I found a letter awaiting me from the Department, forwarding a copy (appended and marked A) of a communication from a Mr. Julian Sucre, of Aspinwall, referring to a plan for a passage across the Isthmus. I called upon Mr. Sucre, and found his plan as I had supposed, one which had been offered some years since by Captain Hugg himself, a master of a coaster, to Commander Selfridge. Commander Selfridge was satisfied at the time that Captain Hugg had no information which he could not procure in better shape by actual survey. Mr. Sucre, who proved to be the husband of Captain Hugg's daughter, showed great reluctance in giving me information in regard to the line, notwithstanding he so freely offered it in his written communication, evidently desiring first to make some definite arrangement as to compensation. He, however, admitted that the list began in the Gulf of San Blas, admitted that he had never seen it, and that he had no information in regard to it beyond a traverse, *i. e.*, a line of compass-courses and the corresponding distances, the following of which from the starting-point, which he thought he should be able to recognize, would give the location of the line. He also stated that the line, though but eighteen miles long, was from sea to sea.

He also acknowledged that Captain Hugg had no instruments, beyond those used in navigating his vessel, for making the survey. He expressly declared that the river Bayano did not form part of the scheme. This was the amount of the information I was able to extract from the gentleman, and it was quite sufficient. To begin with, the distance from sea to sea in a direct line is thirty miles, about, at the narrowest part of the Isthmus. This we have from the marine charts, which are fairly accurate. Information obtained in the manner that Captain Hugg professed to have obtained his, *i. e.*, by merely walking over it, has been proved repeatedly to be absolutely worthless. A man who walks over a trail for fifteen or twenty miles has very little idea of what heights he has passed over; if his path carries him over a steep-sided

hill, he is apt to exaggerate the height of it, but if the ascents ar descents are very gradual, he will often believe that he has been upc an almost dead level. Even very intelligent persons will be deceived such cases. Dr. Cullen, whose name was for years so prominently co nected with the Darien route, asserted, and probably believed, that I had crossed the Isthmus from Escoses Harbor without finding an elev tion of over 150 feet. An instrumental examination by a party und his own guidance found over a 1,000 feet of elevation.

Captain Hugg's route was clearly no other than the San Blas lin the impracticability of which, to my mind, had been thoroughly demo strated.

On communicating with our parties in the field, we found that durir our absence they had been making good progress in their work.

Lieutenant Colby had shifted his camp on March 16 to Lion Hill, ar again on the 20th to Gatun, occupying at each place, by consent of Supe intendant White, the station residence.

Lieutenent Leutze had shifted to a place near Gorgona on the 19t calling his encampment "Camp Colby."

On the day following our return, I was siezed with an attack of feve which confined me to my quarters for nearly a week. Mr. Menoca however, nothing the worse for his trip, went into the field again at onc Lieutenant Leutze was suffering from frequent attacks of the fever, b refusing to spare himself, continued his work to the end, and has su fered for it ever since.

The officers were now making great efforts to complete their lines time to sail for home in the steamer of the 4th of April, and for tl purpose were performing an amount of work which would have brok down the strongest, had it continued. Mr. Colby wishing to commu cate with myself concerning his line, and, finding that I was unable visit him, walked into Aspinwall, a distance of seven miles, one eve ing after having worked from early daylight until 4 o'clock in the aft noon in a heavy swamp. He then started back, and walked nearly to l camp before procuring a horse upon which to ride the remainder of t distance.

March 24, Mr. Leutze again struck his tents and shifted to a poi near Mamei, calling his encampment "Camp Jeffers," for the Chief the Bureau of Ordnance of the Navy.

On the 29th, Mr. Leutze again shifted camp to San Pablo Static occupying, for the first time, one of the station residences, instead of l tents.

On the first of April Mr. Leutze's line intersected that of Mr. Col near the initial point of the latter, and Lieutenant Very connected I traverse with Lieutenant Taussig's original station-mark. On the f lowing day, Messrs. Coffin and Greene brought up the levels and cc nected with Mr. Moser's bench.

April 2, Mr. Colby's line reached the bench at Aspinwall, he havi been delayed one day in trying to improve on a portion of the line ne Lion Hill where, after plotting, it had been found necessary to have little further information.

The natives were now discharged, and the officers and their assistan with their camp equipage, proceeded to Aspinwall. Here what remain of the provisions brought from the United States and such articles outfit as were not thought worth transporting back to New York w sold at auction.

The expedition was then embarked on board the Pacific Mail stea

ship Acapulco, and sailed for home on the 4th of April, arriving in New York on the 12th of the same month.

It is impossible, in a brief account like the foregoing, to give any adequate idea of the amount of labor performed by the officers and men upon a survey of this character, and only those who have had experience in tropical forests, with their dense vegetable growth, the jungle of vines, undergrowth, briars, canes, grasses, the numerous varieties of plants bearing thorns, &c., and who have experienced the annoyance of the myriads of insects, particularly the *garapata* or wood-tick, which infests seemingly almost every leaf that one brushes against, can fully appreciate the character of the undertaking. And too much cannot be said in commendation for the officers for their untiring zeal and energy, and for the cheerfulness with which they encountered discomforts and difficulties. The severest labor, as well as the chief responsibility in the parties rested upon the commanding officers, Lieutenants Leutze and Colby. Upon them devolved the immediate conduct of the survey, the control of the men, and the general comfort of the parties; and each showed himself to be entirely equal to the requirements of his position. Lieutenants Very and Taussig, in addition to running the transit instruments, were required, as is usual, to sketch in the topography. Lieutenant Moser, Messrs. Coffin and Greene, ran the levels, and on connecting their several sections and referring their results to the plane of mean half-tide, found their accumulated error to be less than one-half foot. Dr. Bransford, in addition to taking care of the sick, made some very valuable collections in natural history. He also made a collection of geological specimens, which will pretty completely exhibit the character of excavations and of available materials for construction. The services of Mr. Menocal, the chief-engineer, were simply invaluable. With a thorough knowledge of his profession, full of resources in overcoming impediments, untiring in field-work, he moved from party to party as his assistance was needed; made constant reconnaissances ahead of the line, and thus saved the parties a great deal of useless work, and thereby hastened the completion of the survey. Messrs. Buck, Westerfield, Burnett, Fleming, and Philp, were faithful and intelligent in the performance of their several duties.

WATER-SUPPLY.

By the plan which we propose for the construction of a canal, the water-supply will be drawn entirely from the river Chagres; not counting for the present the influx from springs or that which will be received from two small rivulets received into the canal by cess-pools. It will be carried to the receiving-basin of the canal by means of a feeder to be described farther on.

Gauges of the Chagres, taken with great care, showed that the amount of flow at the point where the proposed feeder leaves the river is about the same as that at the site of the viaduct.

On the 15th of March, the Chagres being at the time at an unusually low stage, even for that season of the year, there was found a discharge of 55,900,800 cubic feet per day. Allowing eighty lockages a day, *i. e.*, forty ascending and forty descending, there would be required, without allowing for the displacement of the vessel in descending, which we have the right to do, making the loss just so much less, 34,400,000 cubic feet per day; adding 100 per cent. for waste, leakage, evaporation, and filtration, a very large allowance, we should still have an excess above the highest possible demand of about 9,000,000 cubic feet per day,

supposing the supply to come from the feeder alone; a large percentage of the water needed would doubtless be supplied by springs. A well standing at the summit of the railroad, 142 feet above the proposed level of the canal, was full up to the surface during the driest period of our stay upon the isthmus. While, therefore, I believe that all loss of water will be more than supplied from sources other than the river, the quantity from the latter source, as shown above, would be ample if such were not the case. It will be shown in the description of the feeder, in what manner it is proposed to get rid of the superabundant waters at high stages of the river.

LOCATION OF THE CANAL.

For reasons already given, it had been determined to cross the river Chagres near the great bend at Matachin, and a short distance above the confluence of the Rio Obispo. The reasons for selecting this point may be briefly summarized as follows:

1st. The near approach of the two ranges of hills inclosing the valley of the river gave good abutments for the viaduct, at the same time giving ample room for a sufficient number of culverts to discharge the waters of the river in times of freshets.

2d. The valley of the Obispo gave a direct and favorable approach to a depression in the divide, passing which the valley of the Rio Grande carried the line by the shortest distance to the bay of Panama.

3d. The level of the highest water-marks at this point were found to be 78 feet above mean half-tide of either sea; adding to this the necessary rise of arch of the culverts, the thickness of wall in the viaduct over the crowns of the arches, and the proposed depth of water in the canal of 26 feet, would give a total of 123.75 feet as the height of the water surface in the viaduct above that of mean half-tide. To descend from this height to the level of the sea would require twelve locks of a side, or twenty-four in all, the greatest number thought admissible, the number required in the Nicaragua line being but ten of a side. To go higher up the river would not only involve a greater number of locks, but would also involve going a greater distance for the initial point of the feeder, or else a higher dam. To go lower down the river, and consequently diminish the summit-level, would of course increase the length of the deep cut through the dividing ridge between the Atlantic and Pacific slopes.

THE VIADUCT.

The proposed viaduct will be 1,900 feet in extreme length; the waterway will be 65 feet wide and 26 feet deep; the side walls 23.25 feet thick at the bottom and 6 feet thick at the top; the thickness of the bottom wall over the crowns of the arches will be 6 feet. Twelve culverts are provided for, with 90 feet span each, and varying in height from the foundations of their respective piers from 40 feet to 12 feet, according to location.

The spring of the arch in each culvert begins at the highest water-mark. The rise of arch is 12.857 feet; the radius of the arch, 85 feet; the width of the piers at their heads is 111.5 feet; their thickness, 25 feet; the area of each pier-head is consequently 111.5 × 25 = 2,787.5 square feet. Allowing 40 tons to the square foot, these will each sustain 249,760,000 pounds weight.

Mr. Menocal computes the actual weight to be borne as follows:

	Pounds.
Concrete: 254,300 cubic feet, at 150 pounds per cubic foot	38,145,000
Water: (65 feet, width of water-way; 115 feet, spread from center to center of arches; 26 feet depth; at 62.5 pounds per cubic foot,) 65 × 26 × 115 × 62.5 equals	12,146,875
Total	50,291,875

or about one-fifth the sustaining-power of the pier.

THE CANAL.

It is proposed to make the surface-level of the water in the viaduct the summit-level of the canal.

PACIFIC DIVISION.

From the end of the viaduct the proposed line leading to the Pacific extends in a general direction of south 37½° east, through the range of hills inclosing the valley of the Chagres, passing which it enters the receiving-basin, of which a description will be given when treating of the feeder.

Leaving the basin, the same course is continued for a distance from the initial point of 1,323 feet; thence the general course is south 32° east for a distance of 27,239 feet, which brings the line to the summit-curve; thence south 50° east 39,565 feet; and finally on a general course of south 80° east 11,376 feet, which brings it to the beach, about one-quarter of a mile to the eastward of the Panama Railroad Company's wharf at Panama. The total length of the Pacific division is 79,509 feet, or 15.8 statute miles. These various sections are made up of straight reaches and of curves, which are arcs of circles; the general course given in each case being the bearing of one end of the section from the other.

The line is laid down to follow as nearly as possible the best, *i. e.*, the lowest profile; it occupies the valley of the Rio Obispo until the foot of the dividing range of hills is reached; crosses the divide through a depression somewhat to the eastward of the point where the railroad crosses; thence descends into the valley of the Rio Grande to the end of section 3, as above given, where it curves to the left and again to the right, finally reaching the point of debouchment. The straight reaches and the curves are numbered consecutively from the Pacific to the Atlantic. A table is herewith appended giving the lengths of the straights and curves, (the length of the arc in feet in the latter case,) the radiuses of the curves, the number of degrees of arc, the total distance from the Pacific terminus, and the middle ordinate for 400 feet in each curve. Practically, this last gives the distance of the middle of the keel of a ship 400 feet in length from the center of the canal, when her bow and stern are exactly in the center.

Two small tributaries of the river Obispo are passed under the proposed canal by means of culverts, their beds being sufficiently low to admit of it.

One very small rivulet is received into the canal by means of a cess-pool. Short bends in the Obispo are occupied by the line of the canal in three localities, and a new channel in each case is provided for the stream.

At the foot of the divide, the Obispo itself, now diminished to a mere thread, is also received into the canal by means of a cess-pool. Descend-

ing into the valley of the Rio Grande, the present channel of the stream is crossed in several places, new channels being provided for each case.

A drain is located leading into the bay of Panama to the eastward the debouchment of the canal, by which the waters of all the small streams coming now into the Rio Grande from the eastward will be discharged, while those coming in from the west will find vent through the present mouth of the Rio Grande.

Twelve descending locks, each with a lift of 10.3 feet, and one tide lock with a lift of 10 feet, will be required in this division. All are favorably located. Nos. 4 and 5, Nos. 6, 7, 8, and 9, are in flights, and No. 12 and the tide-lock are also placed together. All the locks in this section, with the exception of Nos. 10 and 11, are located in hills to secure a natural rock foundation. Nos. 10 and 11 are in earth. The deepest or exact summit cut in this division will be 170 feet above the surface of the water; this is for a distance of only a rod, however, the profile falling rapidly on either side.

The total length of the summit-cut is 4.81 miles, and the average depth of cutting 76 feet above the proposed water-surface. The excavation for the remainder of the division will be but little more than the prism of the canal itself.

ATLANTIC DIVISION.

The following are the courses and distances of the several sections of canal from the viaduct to the Atlantic terminus, the courses in each case being, as before, the general direction, while the distance is the actual length of the straights and curves, viz:

	Feet.
From the viaduct north 37½° west	2,415
Thence north 86° west	19,639
Thence south 81° west	8,753
Thence north 50° west	9,471
Thence north 23° west	14,870
Thence north 57¼° west	38,680
Thence north 28½° west	18,579
Thence north 17½° west	23,843
Total length of Atlantic division	136,550

or 25.9 statute miles. Total distance from sea to sea, 41.7 miles.

For a distance of 7.6 miles from the viaduct the country is very broken. Several hills are passed, the line, however, following the best profile attainable. The longest cut will be 2,500 feet. The intermediate valleys offer ample places of deposit for the material excavated, much of it, indeed, being required for embankments. The line now falls into the valley of the Chagres, and is located in low and occasionally swampy land for a distance of 3.7 miles. Here the excavation will be less than the prism of the canal, the material excavated being used in constructing embankments. Hilly country is then met for about the same distance, after which the line continues in low, swampy ground to Aspinwall Bay.

Thirteen culverts are provided in this division; some for the passage under the canal of small steamers, others to give vent to what water there might be in the rainy season in what were dry ravines at the time the survey was in progress. Two or three other little branches are turned into side-drains. Near Gatun the line occupies the present bed of the Chagres, for which a new channel is provided. The river Gatun, a tributary of the Chagres, is turned into the Mindi, and the

Mindi into the Boca Chica, which discharges into Aspinwall Harbor about one mile outside the proposed debouchment of the canal. Twelve locks will be required, each with a lift of 10.3 feet. These are all located in hills Nos. 2, 3, and 4. Nos. 5, 6, 7, and Nos. 8 and 9, are in flights, respectively. The line of the proposed canal is at no point more than a mile distant from the track of the Panama Railroad.

The prisms of the canal are in earth, rock, and swamp as follows, the depth being throughout 26 feet, viz:

	Width at bottom.	Width at surface.	Slope of bank.
	Feet.	*Feet.*	
Earth	72	150	1 vertical to 1½ horizontal.
Rock	72	126	1 vertical to ¾ horizontal.
Swamp	60	164	1 vertical to 2 horizontal.

These prisms are thought to be ample, even after allowing for the irregularities of excavation, for all purposes of navigation. Ten feet above the water-surface there is a berm on either side of 9 feet, forming a roadway; the same slope is then carried to the surface. In swampy land the banks are, of course, formed by the material taken out.

LOCKS.

The dimensions proposed for the locks are: total length, 500 feet; length between miter-sills, 450 feet; width of chamber, 65 feet. The design of the locks, made by Mr. Menocal, has been fully described in the report upon the Nicaragua survey. They are fed through 60′ side pipes, communicating with the lock-chambers by means of ports, three of a side, one at the head, one in the middle, and one at the foot of the chamber. It is proposed to use hydraulic concrete as dimension-stones, except for miter-sills, for which dressed stone is proposed and estimated for.

Nos. 10 and 11, in the Pacific division, are so located that there will probably be no rock foundation. For these there are proposed a concrete floor of 6 feet thickness; concrete side walls, with a thickness at the base of 30.95 feet, the inner faces to have an outward slope of ¼ foot horizontal to 1 foot vertical; on the outside the side walls to diminish in thickness by offsets of 3.66 feet each, four in number, and at equal distances from the bottom, the walls to be 6 feet thick at the coping.

Nos. 4, 7, 8, 12, and the tide-lock in the Pacific division, and Nos. 1, 2, 5, 6, 7, and 8 in the Atlantic, are believed to be located entirely in rock. For these a lining of concrete is estimated for, the floor to be 2 feet in thickness and the side walls 3 feet.

The other locks are believed to be partly in rock and partly in earth. For these is proposed a floor of concrete 2 feet thick and side walls 3 feet thick at the top of the rock, and increasing thence to the bottom of the chamber in the ratio of ¼ foot to 1 foot of descent. Above the rock, the side walls to be of concrete, and in dimensions identical with the corresponding portions of those in Nos. 11 or 12, Pacific slope, already described.

The turning-gates proposed are of the same character as those used in the United States naval dry-docks.

DRAINAGE.

Culverts have been provided, as already enumerated, for every stream, dry water-course, and ravine whose bed was sufficiently low to pass it

under the canal. In the accompanying drawings each culvert is in elevation.

Side-drains, also already enumerated, are provided for those s favorably located for that purpose with a cross-section, proportio each case to the discharge of the stream or streams which they tended for.

In Table No. 2, hereunto appended, are given the names, if an tion, number, and dimension of spans, and the length of canal (by each culvert, and the length drained by the various side drai

Except the tide-water reaches, the whole canal, after being (may be drained, if necessary for repairs or examination, by cutt the feeder and opening the gates below.

No. 1.—*Table of straights and curves.*

PACIFIC SIDE.

From viaduct to Panama.

Straight.	Curve.	Radius.	Angle.	Length.	Total distance from initial point.	Middl nate feet.
		Feet.	° ′	*Feet.*	*Feet.*	
1	.....	.....	.....	2,490	.....	.....
	1	5,000	52 5	4,546	7,036	
2	.....	.....	.....	1,815	8,851	.....
	2	5 000	58 00	5,062	13,913	
3	.....	.....	.....	14,320	28,233	.....
	3	10,000	3 30	611	28,844	
4	.....	.....	.....	7,020	35,864	.....
	4	20,000	13 30	4,538	40,402	
5	.....	.....	.....	1,240	41,642	.....
	5	20,000	7 05	2,723	44,365	
6	.....	.....	.....	4,640	49,005	.....
	6	5,000	11 50	1,030	50,035	
7	.....	.....	.....	910	50,945	.....
	7	5,000	13 12	1,152	52,097	
8	.....	.....	.....	1,580	53,677	.....
	8	5,000	16 45	1,462	55,139	
9	.....	.....	.....	4,325	59,464	.....
	9	10,000	6 30	1,134	60,598	
10	.....	.....	.....	1,610	62,208	.....
	10	5,000	26 10	2,283	64,491	
11	.....	.....	.....	12,370	76,861	.....
	11	10,000	13 10	2,646	79,507	

ATLANTIC SIDE.

From viaduct to Aspinwall.

12	.....	.....	.....	1,640	.....	.....
	12	2,500	35 30	1,550	3,190	8
13	.....	.....	.....	2,660	5,850	.....
	13	5,000	17 20	1,512	7,362	4
14	.....	.....	.....	7,750	15,112	.....
	14	2,500	27 15	1,209	16,321	8
	15	2,500	28 45	1,253	17,574	8
15	.....	.....	.....	4,480	22,054	.....
	16	5,000	21 00	1,832	23,886	4
16	.....	.....	.....	2,470	26,356	.....
	17	5,000	21 06	1,840	28,196	4
17	.....	.....	.....	775	28,971	.....
	18	5,000	42 05	3,672	32,643	4
18	.....	.....	.....	7,635	40,278	.....
	19	10,000	47 20	8,260	48,538	.....
19	.....	.....	.....	2,420	50,958	.....
	20	5,000	48 00	4,190	55,148	4
20	.....	.....	.....	8,265	63,413	.....
	21	10,000	.....	1,483	64,896	2
21	.....	.....	.....	7,467	72,363	.....
	22	10,000	31 36	5,515	77,878	2
22	.....	.....	.....	820	78,698	.....
	23	10,000	32 00	5,550	84,248	2
23	.....	.....	.....	9,580	93,828	.....
	24	2,500	57 15	2,498	96,326	8
24	.....	.....	.....	2,065	98,391	.....
	25	5,000	30 00	2,618	101,009	4
25	.....	.....	.....	9,080	110,089	.....
	26	5,000	60 00	5,236	115,325	4
26	.....	.....	.....	8,590	123,915	.....
	27	10,000	16 30	2,880	126,795	2
27	.....	.....	.....	1,175	127,970	.....
	28	5,000	47 40	4,160	132,130	4
28	.....	.....	.....	4,420	136,550	.....

Total length from viaduct to Aspinwall, 25.86 miles.

TABLE No. 2.—*Culverts, side-drains, &c.*

No. of culverts.	Name of river or ravine.	Location.	No. of spans.	Length of spans.	Rise of arch.	Height of pier.	Length of canal
							F
1	Ravine	C. 12, center	3	75	13	.....	2
2	Ravine	S. 13, com	1	100	16	14	2
3	Ravines	S. 14, com	3 3	60 75	15 25	11 13	3
4	River near Gorgona	.....	1	100	17	14	1
5	Ravine and Rio Juan Grande	S. 14 and C. 14	3 3 1 1 3	75 75 81 81 40	15 17 14 14 6	....	5
6	Rio Pisco and ravines	S. 15, mid	3	75	13	.....	6
7	Gullies	.....	1	81	14	.....	5
8	River near Barbacoas	S. 18, com	3 3	75 75	13 13	....	5
9	Frijole Grande	C. 19, com	3	40	6	.....	4
10	Frijole	S. 19, end	1	81	14	.....	15
11	Rio Agua Salud	S. 20, end	3	60	9	.....	7
12	Ravine in very broken country	S. 20, end	1	60	9	.....	2
13	Qua. Aujeta	S. 21, com	3	75	17	.....	6
14	Rio Tortuoso	C. 22	3 3	75 75	17 17	....	5
	Rio Gatun drains into Mindi Rio Mindi drains into Boca Chica	.....	.....	.....	.....	.....	58
	Viaduct Rio Chagres near Matachin	.....	12	90	12.8	12 to 44	3
	Basin near Obispo Station	.....	.....	.....	.....	.....	2
1	Rio Cabulla	.....	1	81	14	.....	3
2	Near 40-foot falls	.....	3	75	17	.....	5
	Rio Sardanilla; well into canal	.....	.....	.....	.....	.....	6
	Upper Obispo; well into canal	.....	.....	.....	.....	.....	19
	Rio Grande drained each side of canal	.....	.....	.....	.....	.....	50

THE FEEDER.

The manner of locating the feeder has been already given.

At a point distant some twelve miles by the traverse above the site the viaduct, the valley of the Chagres was found to be inclosed betw two solid walls of rock, very steep-sided, and approaching within l than 600 feet of each other.

Here a location was selected for a dam, by which to raise the wat of the river to a height of 12 feet (being one foot for each mile of d tance) above the proposed surface of the water in the viaduct. T exact spot chosen was at a short bend made by the stream in its narr valley. The channel-way is but 140 feet wide, with a rocky bank a bed; it is proposed to place the dam across the lower side of the ben and across the channel from side to side of the valley, raising the wate 36 feet above the surface as it stood at the time of the survey.

An admirable foundation and admirable abutments are secured for by this location. In the accompanying drawings are shown the cros section of the river-valley, together with the dimensions of the pr posed structure.

As has been said, the initial point of the feeder is some 4,800 feet b the river-traverse above the site of the dam, but, owing to a curve the river, quite as near to the line of canal. The effort to locate th feeder on a grade-line by which an open cut of moderate depth could b secured proved unavailing, except by a vast increase in the lengt and even when the grade could be followed the hill-sides were fr quently so steep as to give no location. The elevations were often mu too high, and in two localities considerably too low for the purpose.

As finally located, the feeder proposed is 10.22 miles long, in which distance there will be required seven sections of tunnel of the following lengths, respectively, viz:

	Feet.
No. 1	4,200
No. 2	5,600
No. 3	300
No. 4	800
No. 5	1,400
No. 6	900
No. 7	500
Aggregate of tunnel	13,700

There will also be required two inverted siphons of 4,530 feet and 12,000 feet length, respectively. Computations were also made for aqueducts in place of the inverted siphons, and the cost found to be so little in excess that Mr. Menocal strongly recommends their use instead. The remainder of the distance will be in open cut.

The feeder discharges its waters into a receiving-basin of 22 acres superficial area, and of which mention has already been made. This basin is located in the Pacific division about 1,000 feet from the end of the viaduct, and is formed by the erection of a dam to inclose an angle between two spurs of the range of hills forming one side of the valley of the Chagres. The length of the dam will be upon the top 1,760 feet; its height from the lowest foundations will be 74 feet. The channel of the Rio Obispo has to be turned for a short distance to give room for the dam.

A plan of the basin, with a profile showing the location of the dam, and a cross-section of the latter is among the accompanying drawings.

It is proposed by a gate at the head of the feeder to cut off the supply of water in the canal when found desirable. All the superabundant waters of the Chagres will then escape over the dam, and will pass through the culverts under the viaducts.

The floods of the Chagres are caused in part by the backing up of the waters from below. Much of this could be prevented by clearing off the timber in the bends of the river, a work, by the way, which it would well repay the railroad company to undertake, the road suffering a good deal at times from being overflowed.

CHARACTER OF EXCAVATIONS AND MATERIALS FOR CONSTRUCTION.

In the valley of the Rio Grande the land is generally low and swampy; the soil seems to be an admixture of sand and clay, with a great deal of ooze in the bed of the stream.

Approaching the divide, we find a vegetable mold overlying a stratum of clay, with sandstone cropping out so often, and appearing in the cuts to be so near the surface, that in our computations for excavation we have taken the rock to be within 10 feet of the surface, not only in the dividing ridge, but in all the hills throughout the line. In the valleys 20 and 30 feet were allowed for earth. The sandstone is being quarried on the Pacific slope at Paraiso, about nine miles from Panama, and at Bahio station, on the Atlantic side, and seems to be of the same character in both places, so soft that, with an ordinary geologist's hammer, I have broken to fragments pieces a half cubic foot in size with but two or three blows. Exposed to the atmosphere it becomes honey-combed upon the surfaces. It is used by the Panama Railroad Company in

bridges, &c., but would not be at all suitable for structures required to sustain great weight or to withstand any severe shocks.

The excavation in the hills and the higher valleys and plains will present only the ordinary features of vegetable mold overlying clay, and under that the sandstone, which last can be removed by the pick and crow-bar, though it would probably not be as economical a method as blasting. Some of the swamps, particularly what is known as Miller Swamp, some twelve miles from Aspinwall, gave great trouble to the railroad company, and I fear would do so again in the event of the construction of a canal on this route.

The soil is a soft ooze of unknown depth, and I greatly fear that would be exceedingly difficult to prevent the channel's filling up as fast as opened. Near Aspinwall the swamp seems to overlie a bed of coral and a channel could probably be maintained without trouble.

MATERIALS FOR CONSTRUCTION.

There is very little material, except timber, fit for purposes of construction. No rock was found which could be used as dimension-stone and it is even doubtful whether any would answer for concrete.

Some limestone of fair quality was found near Empire and along the banks of the Chagres. Of timber, there is great abundance.

HARBORS.

Panama.—The only improvement proposed in the bay of Panama the excavation of a straight channel 18 feet deep at mean low water out to the 18-foot curve, a distance of 9,200 feet. As there are some [illegible] feet of rise and fall of tide, this channel would have 26 feet of depth whenever the water was above half-tide, or for over twelve hours each day.

Large vessels, or vessels of 18 feet draught and over, of which, as I believe, there will be very few in the future, would have to wait for a favorable stage of the tide to enter or leave the canal, making a delay in extreme cases of from five to six hours.

The enormous additional cost of giving a deeper channel we regard as a worse evil than any small delays to ships in passing. The waters of the bay are so very quiet that no protection is needed for the entrance of the canal.

Aspinwall.—Estimates have been made for deepening a channel in the bay of Aspinwall out to the 26-feet curve, a distance of 1,826 feet, the few inches of rise and fall of the tide offering no such help as we have at Panama.

A breakwater is also estimated for, to extend from the point where the light-house is located in a west direction for a distance of 1,500 feet which would render the harbor perfectly safe in all weathers.

The breakwater, although exceedingly desirable, is not absolutely necessary, and its construction might at least be delayed until the canal should begin to earn something.

The shores surrounding the bay of Aspinwall are of coral formation and all the reefs in the harbor seem to be of the same.

COMPUTATIONS AND ESTIMATES.

Careful computations have been made by Mr. Menocal, and by Lieutenants Taussig and Moser and Masters Coffin and Greene, under

immediate direction, of the amount of excavations in rock and earth, of materials, masonry, &c., required for the construction of the canal, the erection of locks, dams, &c., for the improvement of the channels from the termini of the canal to deep water in the bays of Panama and Aspinwall, respectively, and for a breakwater in the latter. And upon these computations Mr. Menocal has estimated the cost of the work.

The estimates are herewith forwarded.

The following is a summary of the estimated cost, viz:

Excavations and embankments	$37,392,935
One tide-lock, Pacific side	290,815
Twelve lift-locks, Pacific side	3,931,672
Twelve lift-locks, Atlantic side	3,787,286
Viaduct across the river Chagres	1,415,333
Feeder	7,954,182
Dam across the river Chagres	805,908
Dam to confine receiving-basin at Obispo	1,606,869
Fourteen culverts, Atlantic side	12,579,878
Two culverts, Pacific side	781,600
Drains, Atlantic side	921,073
Drains, Pacific side	368,638
Two wells, or cess-pools, to drain streams	13,886
Excavations, bay of Panama	1,992,585
Excavations, bay of Aspinwall	983,785
Breakwater at Aspinwall	782,673
Total	75,609,108
Adding 25 per cent. for contingencies	18,902,252
Total estimated cost	94,511,360

The following is the scale of prices allowed, viz:

	Per cubic yard.
Excavations in rock	$1 25 to $1 50
Excavations in earth	35
Excavations in swamp	40
Embankment	15
Hydraulic concrete	8 00
Dressed stone for miter-sills of locks	18 00
Excavation in tunnels for feeder, sandstone	4 00
Excavation in rock for cess-pools	4 00
Under-water excavation, bay of Panama	5 00
Under-water excavation, bay of Aspinwall	5 00
Pierre Perdue breakwater, Aspinwall	3 00 to 4 00

ADVANTAGES AND DISADVANTAGES OF THE PANAMA ROUTE.

The advantages of this line are: an ample water-supply; an open cut with but a moderate average depth of excavation; a comparatively short distance, 41.7 miles, from sea to sea; fair harbors on either side; the proximity of a well-constructed railroad; the established communication with the principal ports of the world; the absence of high winds, and, in common with the whole isthmus, the fertility of its soil, and the salubrity of its climate during the dry season.

The disadvantages are: the large annual rain-fall; the want of material for construction purposes; the character of some of the swamp-lands in certain portions of the line; the amount of tunneling required in the feeder; the necessity of a viaduct; the prevailing calms of Panama Bay, causing tedious delays to sailing-vessels; and, finally, as compared with more northern lines, the greater distance of Panama * from the ports upon the west coast of the United States.

* Panama is six hundred miles farther from San Francisco than Brito, the Pacific terminus of the proposed canal through Nicaragua.

CLIMATE, HEALTH, ETC.

The year is divided, as in other parts of the American isthmus and of Central America, into two seasons, the rainy and the dry, the former beginning in the latter part of May and lasting until the last of November, when it gives place to the latter, which lasts till May comes around again. The annual rain-fall is from 90 to 140 inches.

I do not regard the climate as an unhealthy one for temperate persons, who exercise the proper care in their diet and habits. The diseases, as I have had occasion to say in a former report, are few in number, simple in character, and generally yield readily to treatment, unless the patient be a dissipated person. The report of Dr. Bransford will be found interesting on this point.

In estimating the amount of labor which can be performed by a man in Central America, comparison is often made with the Southern States of the Union. This is hardly a fair example upon which to form a judgment. The trade-winds, blowing home for a large portion of the year, afford an element which the climate of our Southern States does not possess, and which greatly mitigates the heat, or at least the ill effects of heat.

The temperature in the shade averages 82°, about, the year round, and the barometer 29.95, about.

CONCLUSION.

Mr. Menocal, the chief engineer of the expedition, was called away very suddenly to go to Nicaragua, upon a mission in which he is now engaged, under the Government, and did not, I regret to say, make a report; he had, however, completed the estimates already given, and left his work in such condition that, although it would have been exceedingly interesting, no detailed report was actually necessary.

Since Mr. Menocal's departure, Lieut. E. D. Taussig, U. S. N., has been in charge of the completion of such matters as required it, and has exhibited the same close accuracy and attention that have characterized his work since his first connection with the expedition.

I have the honor to be, sir, your most obedient servant,

EDWARD P. LULL,
Commander, Commanding Expedition.

Hon. GEO. M. ROBESON,
Secretary of the Navy.

NAVY DEPARTMENT,
Washington, March 8, 1875.

SIR: The Department incloses for your information and consideration a copy of a communication from Mr. Julian Sucre, Aspinwall, referring to a plan for a passage across the Isthmus. This letter was transmitted to this Department by the honorable Secretary of State.

Very respectfully,

GEO. M. ROBESON,
Secretary of the Navy.

Commander E. P. LULL, U. S. N.,
Aspinwall, United States of Colombia.

COLON, ASPINWALL, *January* 30, 1875.

SIR: I beg most respectfully to submit for the consideration of your Government the t that I hold in my possession the plan taken by the late Captain John Hugg, of ltimore, of a passage across the Isthmus of only eighteen miles, and which the de- sed traveled over on three different occasions during his life-time. This plan is the acy left by the deceased to his children, and with whom I am connected. If the te Department deem it practicable to make use of it, the family have no objection, l if consistent with the desire of the Government I would join the party on the sur-, and, as I presume, that route will be adopted for the proposed canal, then the ily will expect some remuneration will be given to them by your Government.

beg to inclose herewith a newspaper with some remarks on the subject in Spanish ich may better explain this matter.

I have the honor to be, sir, your most humble servant,

JULIAN SUCRE.

'he honorable SECRETARY OF STATE,
United States of America, at Washington, D. C.

THE INTEROCEANIC CANAL.

Ve extract the following paragraphs from a letter which has been addressed to us. 'apt. John Hugg, a North American citizen and native of Baltimore, who, for nearly e years past has been sleeping the sleep of death, bequeathed to his numerous fam- before he went down to the grave, a legacy which was perhaps thought by them be of very small value, but which, nevertheless, may serve to immortalize his name l greatly to advance the material progress of America, of Europe, and of the entire rld.

'his legacy is nothing less than a route for the opening of communication between two oceans, which is the result of the numerous observations made by Captain gg while crossing the mountains, which he did three times.

A canal constructed by this route would be scarcely eighteen miles in length, and I fully authorized by the family of the unfortunate navigator to state to all nations, ticularly the United States of America, that if they think proper, they may address , and I will make all such arrangements as the case may require.

t is by no means my desire to represent Captain Hugg as having been a highly sci- ific man, but only to praise his indomitable perseverance in the execution of so dif- alt an undertaking, which he accomplished in spite of innumerable obstacles.

If the Government of the United States shall, as I hope it will, make an equitable angement with the Hugg family, and resolve to examine the route in question, it is re than possible that its long-cherished hopes and our brightest dreams will soon be alized.

JULIAN SUCRE.

COLON, *January* 16, 1875.

No. 13.

SURVEY FOR AN INTEROCEANIC CANAL.

eport of Lieut. Frederick Collins, U. S. N., on the survey of the proposed route for an interoceanic ship-canal, by way of the Atrato, Napipi, and Doguado Rivers, in the State of Cauca, United States of Colombia.

NAVY DEPARTMENT,
Washington, D. C., November 4, 1875.

SIR: I have the honor to submit the following report of the operations the expedition engaged, under the direction of the Department, ring the past winter, in surveying the Napipi route for an inter- eanic ship-canal, together with a discussion of the results obtained bearing on the question of the practicability of such a canal in that cality.

Agreeably to the Department's special instructions of the 9th ecember, 1874, I sailed on the 5th January last from New York for

Aspinwall, with the necessary outfit of instruments and stores, and the following officers, who had been ordered to report to me for duty: Lieut. J. G. Eaton, U. S. N.; Lieut. J. T. Sullivan, U. S. N.; Lieut. C. Paine, U. S. N.; Asst. Surg. Earnest Norfleet, U. S. N.

On the 14th we arrived in Aspinwall. On the 18th the United States steamer Canandaigua, detailed by the Department to transport the expedition to the Gulf of Urabá, came in, and I reported to her commanding officer, Capt. Edward Barrett.

On the same day Ensign H. H. Barroll reported to me for duty, having been transferred to the Canandaigua for that purpose by Rear-Admiral Mullaney, in compliance with telegraphic orders from the Department, prior to her sailing from New Orleans.

The non-arrival of certain of our stores that failed to come in the steamer that had brought us out, compelled us to await the arrival of the next steamer; but the time was put to good use in ranging our instruments and in practicing all hands in the work before us.

On the morning of the 28th we sailed from Aspinwall, and at 5.30 p. m. on the 30th came to anchor off the Coquito mouth of the Atrato. At noon on the 31st, all our instruments, provisions, and stores having been snugly stowed in the launch and second cutter, we shoved off in tow of the steam-cutter, and started upon our journey up the Atrato. Our party consisted of the officers just named, a rodman and interpreter, whom I had hired in Aspinwall, and a detail of five men from the Canandaigua. In addition, there were twelve men, under Master Richman and Assistant Engineer Herwig, to take the boats back.

Owing to delay in finding the mouth of the Caño Coquito, we did not get fairly started on our journey up the river till noon of February 1, when we crossed the bar, finding 4 feet of water on it.

Our five days' trip up the Atrato was tiresome in the extreme, the boats being so completely filled with our stores that little chance was left for comfortable quarters either by day or night.

The little steam-cutter proved, as had been anticipated, barely equal to her task, and, with frequent stoppages to clean fires, and mend this or that, she was scarcely able to make three knots over the ground against the rapid current. We had every day, for a few hours, favorable winds, and always made sail on the boats when it would draw, thus relieving the steam-cutter considerably. We stopped at but one of the three villages that are to be found on the Atrato below the Napipi. This was at Sucio, the first of the three and the most important. There we were well received by the alcalde and custom-house officials. The alcalde informed me that he had instructions from his government to afford the expedition every possible assistance. I expressed my appreciation of this kindness, but declined other assistance than a supply of good wood for the steam-cutter, which was very obligingly furnished.

As large quantities of drift-wood were floating down the Atrato, I did not think it prudent to run up stream at night. We therefore came to anchor just after dusk, and got under way just before day-light each day. While thus at anchor we measured, by means of the current-meter, the surface-velocity of the Atrato. The mean of our experiments showed a surface-current of 183.5 feet per minute.

At 5 p. m. on Friday, February 5, we reached the mouth of the Napipi, having been under way in all about 59 hours.

The next day, with Lieutenant Sullivan, I went to the village of Vejia del Fuerte, about fifteen miles farther up the Atrato, for the purpose of engaging native laborers. Lieutenant Eaton was left with directions to

;e our stores as quickly as possible, and turn the boats over to Richman, in order that he might return without delay to the

jia, I found no difficulty in securing as many natives as I wished. :d twelve of the best, agreeing to pay each $25 per month, and :heir subsistence. This plan was found to work much better e old one of providing them with food from the stores of the on, and it was much more economical. I also hired six canoes, ate of $5 per month each.

'onday, February 8, we started up the Napipi for the point at had determined to begin work, and on the 9th the regular labors ıurvey commenced. From this time till work stopped on the April, not a man connected with the expedition was idle for a day ; was physically able to work. The force was divided into small commanded by Lieutenants Eaton and Sullivan, and myself, ıg on different portions of the route, as circumstances rendered nt, and the work was pushed with energy.

imits of this report will not permit a detailed account of the ›ns of the expedition. Several circumstances combined to render k much harder than had been anticipated, and our force was so at extraordinary exertions were required of each. Had the little ot made up in metal what it lacked in numbers, it could not ıcceeded in accomplishing half its allotted task. We were , however, by an exceedingly dry season, and by the general alth of the party, though one of the men gave out at the very ng of the work, and was of little use from that time to the end. ıe 28th of April I was much surprised by the arrival of Master n at headquarters, at the junction of the Napipi and Merindo with word that the Canandaigua's boats were waiting for us at ıth of the Napipi. I was the more surprised at this, as I had l a communication from the Department to the effect that the or- the commanding officer of the Canandaigua had been so changed lay her arrival in the Gulf of Uraba till the 15th May. It ap- however, that Captain Barrett had received neither this order, letters I had sent him, and had accordingly proceeded to the the 15th April, as directed in his original instructions.

:tunately, also, the ship was nearly out of bread, and the instruc- Master Richman were to wait but five days, two of which he had consumed in reaching us from the mouth of the Napipi. I at ›ught I should be compelled to let him return without us. But, flection, I concluded that it would not be the part of prudence ›. I knew that, by that time, Lieut. Sullivan, who was at work Pacific slope, must have connected his line with the beach, and e main labors of the survey were completed. Our provisions early exhausted; the wet season was setting in; many of the 'ere sick; all were showing more or less the effects of their long ınd our natives were tired of the work, discontented, and anxious 'n to their homes. Under these circumstances I did not think it ither to continue the exposure of the party for an indefinite or to put the Department to the expense of sending twice after ply for the purpose of putting the survey in a little more satis- shape.

refore dispatched a messenger to Lieutenant Sullivan, with orders work at once and return to headquarters with all possible dis- He arrived with his party at 5 p. m. on the 30th. On the fol- morning all hands started down the Napipi. We reached the

boats at 10 a. m. on the 2d of May, and at 8 a. m. on the 5th were once more aboard the Canandaigua. While she was getting steam, I went, with Lieutenant Sullivan, to the village of Turbo, where, before going up the river, we had made arrangements for securing a quantity of the coal known to exist in that locality, in order that its commercial value might be tested. I was not greatly surprised, however, to find that no steps had been taken to fulfill the contract, and, as the Canandaigua was obliged to proceed immediately, we had to leave without it.

On the 7th of May we arrived in Aspinwall, and on the 16th sailed in the Pacific Mail steamship Acapulco, for New York, arriving on the 25th.

On the 27th I reported in person the return of the expedition, and on the 31st was detached from the command and ordered to special duty in connection with the preparation of the data obtained.

On consulting with the Chief of the Bureau of Navigation as to the best form in which to present the information acquired by the expedition, it was thought best to prepare estimates of the amount of work the construction of a canal by this route would involve, and, for the purpose of comparison, to calculate from these estimates its probable cost, allowing the same prices that had already been allowed for similar proposed work elsewhere. I have, therefore, the honor to present herewith such estimates, together with a detailed description of the works supposed to be necessary to the successful operation of a ship-canal in that locality.

In reference to these estimates I would say that they are founded on the general plan for a canal proposed by Commander T. O. Selfridge. This plan, in its essential features, is to follow the left bank of the Napipi to its junction with the Doguado. There to cross the Napipi by means of a dam of sufficient height, and then to follow the valley of the Doguado till the cutting becomes so deep as to compel a resort to tunneling. Then to pass under the divide by means of a tunnel coming out on the Pacific slope in the valley of the Chiri-Chiri River, in which are to be situated the locks necessary to descend to, or ascend from, the Pacific Ocean at Chiri-Chiri Bay.

In treating of the proposed work, I have, for convenience of reference, divided my remarks into eleven heads to correspond with the paragraphs of my instructions, as follows:

I. General description of the country along the proposed line; description of the proposed work; manner of conducting the survey.
II. Culverts and works to protect the canal from floods.
III. The dam and basin for crossing the Napipi.
IV. The tunnel and pointing-basin.
V. Locks.
VI. Characteristics of the strata requiring excavation.
VII. Water-supply and aqueduct from the Rio Cuia.
VIII. Meteorology and climate.
IX. Materials for construction.
X. Harbors.
XI. Local advantages and disadvantages; general remarks.
XII. Synopsis of estimates.

I.—GENERAL DESCRIPTION OF THE COUNTRY IN THE VICINITY OF THE PROPOSED LINE; MANNER OF CONDUCTING THE SURVEY; DESCRIPTION OF THE PROPOSED CANAL.

The State of Cauca, within the limits of which lies the proposed canal route now under consideration, is one of the seven States composing the

United States of Colombia, as the old republic of New Granada is now called. Cauca occupies the extreme northwestern part of the South American continent, and it is divided into four provinces or cantons. Of these the canton of Choco is the northwesternmost, lying contiguous to the isthmus of Darien, and extending from 4° to 8° north latitude. It lies entirely to the westward of the Cordilleras of the Andes, which leave the Pacific coast between the second and third parallels of north latitude and divide into three branches, the intervening valleys being drained by the Magdalena and Cauca Rivers. The strip of land forming the canton of Choco is drained by two large rivers; the Atrato flowing to the northward into the Caribbean sea, and the San Juan to the southward into the Pacific. Between these rivers and the Pacific coast runs a range of comparatively low hills, rising in most cases abruptly from the shore. This range turns to the eastward in about 8° north and joins the Cordilleras of the isthmus of Darien.

The Atrato River rises in about 5° 20′ north latitude, and, flowing nearly parallel to the Pacific coast, empties into the Gulf of Uraba through a delta comprising many mouths. As is usual under such conditions, these mouths are obstructed by bars, but within the bar the channel of the river is broad and clear, and 26 feet of water can be carried at the lowest stage of the river for a distance of one hundred and sixty miles. Above this point it begins to shoal, but 6 feet may be carried for another hundred miles, at which point Quibdó, the capital and principal town of the canton, is situated.

In the canal scheme now under consideration, it is proposed to use this river for about one hundred and fifty miles, at which distance from its mouth it receives from the westward a small tributary, the Napipi. Opposite this point the coast of the Pacific trends far to the eastward, so that its farthest indentation, Chiri-Chiri Bay, is but about twenty-eight miles, in a direct line, from the Atrato. Here it is proposed to construct the canal. Although the direct distance is, as has just been said, but about twenty-eight miles, it was found necessary upon actual survey to introduce many curves in order to keep the most favorable ground, and the exact length of the line about to be described is increased to 30.25 miles. Of this distance 3.5 miles are in tunneling, the summit-level of the canal having been raised by locks 143 feet above mean tide.

With this brief indication of the geographical position and general character of the proposed work, I will proceed to a more detailed description of the topography of the country in its immediate vicinity, as developed by our surveys of the past winter.

Our observations in every part of this region have shown its topographical features to be wonderfully systematic. From the main divide, which skirts closely the Pacific coast, come down to the eastward long ridges, forming the divides between the valleys of the various tributaries to the Atrato. These ridges send off to the northward and southward smaller spurs, and these divide again and again until the whole country is overspread with ranges of hills, running the one into the other like the veins of a leaf. A detached hill is rarely to be met. The crests of these spurs and ridges are usually very narrow, and their sides descend abruptly, often precipitously. Their crests, rising and falling with gentle slopes, afford always good ground for walking, and they are used by the natives for their roads or trails almost exclusively, they having long ago discovered that the longer way around, with good walking, is a surer way home than the shorter which, cutting across the ridges, presents a succession of steep and slippery hill-sides. Crossing these steep ridges with our line of survey, as we were frequently com-

pelled to do, caused us great delay and much hard labor. The ope of leveling over such broken ground is, of course, extremely slo tedious, while the mere matter of walking to and from work, wh distance is at all considerable, is so exhausting as to impede th gress of the survey very seriously.

Immediately along our line of survey the country naturally di itself into four divisions as regards its topographical chara tics. First, there exists from the banks of the Atrato, for som miles to the westward, a flat, swampy region of a lower average than the banks of the adjacent rivers. During the wet months region is frequently inundated to a considerable depth. Durin dry seasons its higher portions become sufficiently firm to be pass but those of a lower level always remain open-water swamps or morasses. This portion of the route is, in fact, the delta of the N since it is bounded to the westward and northward by a second mo that river, called the Braso Muriel, while a third mouth, the Palm flows through its central part. It includes, in the portion nea Atrato, two large cienegas or lagoons, which, during the wet month lakes, with an average depth of 6 to 10 feet of water, but which are m less dried up as the rains lessen. These cienegas at one time threate put a stop to our surveys, but by the indefatigable exertions of Li ant Eaton an isthmus, or natural causeway, as he terms it, was between them, which was of sufficient firmness to permit the pa of his party. But one hill was discovered in this portion of the It is about 90 feet in height, and is doubtless an upheaval of the u lying rock, against which, and around which, the *débris* brought by the river has accumulated to form the delta.

We had no means to enable us to determine the depth at whic bed-rock lay in this locality. Poles 10 to 15 feet in length were sl down without resistance. In the calculations for the canal, a thic of 30 feet of earth has been allowed.

The vegetation of this section is peculiar. Away from the imm banks of the rivers there are comparatively few trees, and they p pally the Quita-sol palms, covered with long, sharp thorns, and a ing little shade. The ground is covered with coarse swamp and mock grass, that cuts like a knife.

Some miles of river-navigation might be saved by turning the more to the northward through this section than it has been proj Such a deflection would increase its length about one mile. It wou for the most part through the Cienega Muriel, and the ground wou is likely, be quite as favorable as that shown on our profile. Sho canal ever be built by this route, it would, no doubt, be found advan ous to follow such a line in preference to the one here proposed.

The second topographical section extends from the Braso Muriel, six miles to the westward. It is characterized by the extension o spurs of the divide between the Opogado and Napipi Rivers to the banks of the latter, rendering it necessary to cross them continually the survey.

Extended reconnaissances were made to determine the practica of flanking these hills by a detour to the northward; but in almost case they were found to increase in altitude as they receded fro river, proving to be parts of the system just described, and not det hills that might have been flanked.

When, therefore, these spurs butted on the river, there was no c left but to cross them. It is quite possible that many of them r have been crossed more favorably than they were. Our limited

and small force did not enable us to be certain that we were always on the best ground.

In projecting the canal-line after the field-work had been plotted, it was found that by diverting the Napipi in several places, by short cut-offs through its sharp bends, and carrying the line to the southward, several of these hills could be avoided. The line was therefore laid down in this way, and our profile shows it as thus amended. Ample allowances, it is believed, have been made where the canal-line thus deviates from the line of survey, and in the accompanying synopsis will be found estimates for the required diversion of the river.

The third topographical section extends from the western limit of the second to the point of crossing the Napipi, near the junction of the Merindo. In this section the spurs or ridges extend but rarely to the river, so that it was found possible, by keeping the line well to the southward, to avoid crossing them. The profile, therefore, of this section shows level or undulating ground, with no elevations of any considerable magnitude. Our reconnaissances developed the same system of ridges here as elsewhere, except that they terminated, generally, at 1,000 or 1,500 feet back from the river instead of extending to its very banks. This section, in common with all the others except the first, is well covered with heavy timber, which appears wherever the ground loses its swampy character.

The boring-apparatus, which had been supplied for determining the character of the strata along the line, was found to be so unsuitable that but little use could be made of it. A few borings were obtained, and the lack of others was supplied as well as possible by a careful observation of the exposures on the banks of streams crossed by the survey. It was found that on the crests of the ridges the rock was always close to the surface, frequently cropping out. In the intervening valleys it was found at depths varying from 10 to 20 feet, the depth increasing with the distance from the nearest hills.

The fourth topographical section extends from the crossing to the Pacific. It is characterized by being extremely broken and by the great height of its ridges as compared with those of other sections.

The distance between the Doguado and Merindo Rivers is so small, and the divide between them is so high, that its spurs extend almost invariably directly to the river-banks, and it is impossible to carry a line of survey up either bank of the Doguado without crossing these spurs continually. Of course, the nearer the line is to the river, the less will be the elevation at which they will be crossed. My instructions to Lieutenant Sullivan, who commanded the party making this survey, were to keep the line well down toward the river to secure the best ground. This was done as well as the circumstances of the case and the state of our knowledge at that time would permit. But it was subsequently found that the line was farther from the river than we had supposed, and that it did not show as favorable a line for the canal as it was evident must exist.

Having, therefore, this line of survey and another, made by myself up the bed of the river, I projected the canal-line as close to the river as possible without introducing impracticable curves, (2,500 feet was the minimum radius allowed,) and approximated the elevations by adding to the elevations of the river-bed the observed height of its banks, and to this a part of the difference between it and the corresponding elevation on the main line proportioned to its distance from that line.

That part, then, of our profile between the crossing of the Napipi and the eastern face of the tunnel must be regarded as, to a certain extent, hypothetical. But the projected line is always near one or the

other of the lines of survey, and such allowances have been made that I am certain that our profile is, if anything, less favorable than the reality.

The height of the dividing ridge which is found in this section is, at the point crossed by our survey, 778 feet. The crest of the divide is only 7,000 feet in direct horizontal distance from the Pacific beach.

Manner of conducting the survey.

Our main line of survey was run entirely with two instruments constructed by Wurdeman, of Washington, and called "gradienters." These instruments had been in use on the previous survey and had been found admirably adapted to the rapid reconnaissance of open rivers. They particularly recommended themselves to us, when fitting out for the last expedition, from the fact that they enable the force required for the work of survey to be reduced to a minimum. The method of measuring distances by means of a micrometer attachment to the telescope is also exceedingly convenient in a rough country, but for a regular survey, where it is desirable to run for long distances on a given course, these instruments are not well calculated. They are very trying and vexatious instruments to run; they are hard to keep in adjustment and very easily broken; and it is extremely difficult to plot their work over rough country with any sort of accuracy. They would be excellent instruments to put on board ship for the reconnaissance of rivers, and for use in surveying harbors; for any other purposes I would not recommend them. Our experience, however, shows that, when carefully handled, they will give fairly reliable results. We had no opportunity to run extended lines of check-levels for the purpose of testing the accuracy of our work, but on several occasions during the progress of the survey checks were obtained, in some cases lines of considerable length, over very rough ground, being involved. In each of these cases the disagreement was less than five-tenths of a foot, which is quite as close as could have been expected.

On the line for the aqueduct, we connected with the survey of 1873. Here a line more than twenty miles long, and mostly over the roughest possible ground, was involved, and the discrepancy was between 3 and 5 feet. I can give it no closer, as the actual point on which to connect could not be determined, the mark having disappeared. But the nature of the ground admitted of no greater limits than those assigned, and the difference was assumed at 4 feet. I therefore conclude that our elevations are sufficiently accurate for preliminary reconnaissance. Our elevations were obtained entirely by absolute measurement with the rod and spirit-level, using only horizontal lines of sight. This involved great labor when ascending or descending the steep spurs so abundant in some portions of the line. The measurement of the angle of elevation, as was done by Lieutenant Michler, when surveying the Truando route, would have materially diminished our labor and correspondingly facilitated our progress, but our instruments were not well adapted to this method.

The distances on the main line of survey were generally measured by the micrometer. Two targets were fixed on the leveling-rod, 5½ feet apart. The number of turns and fractions of a turn of the micrometer-screw corresponding to every distance of 10 feet, from 40 feet up to 500, were determined by a series of careful experiments before leaving Aspinwall. For the intermediate feet, interpolations were made, and the whole tabulated for ready reference.

The advantages of such a method of measuring in a rough country can be readily appreciated. As for its accuracy, I caused the distances thus obtained to be frequently checked by the standard tape, and the results were such as to convince me that, for a rapid survey, it is superior to the common method of chaining. On hill-sides, where the rise or fall was so rapid as to necessitate sights of less than 40 feet, we resorted to the tape or chain.

Our reconnaissances for developing the topography on either side of the line were necessarily so rapid as to allow only the roughest determination of distance, direction, and elevation. The first was determined by pacing; the second by the pocket-compass; the last by the hand-level or aneroid-barometer. Neither, of course, can be relied upon except in a very general way; though, after becoming expert by much practice, our results often checked with surprising accuracy.

Finally, I may say with regard to our survey, that we did our best with the means at hand, actuated solely by an honest desire to do our work faithfully and learn the truth. Pressed as we were for time, the desire to progress with speed was never allowed to interfere with good work. The following brief extract from my instructions to Lieutenant Eaton will show how this important matter was regarded, and I am sure my ideas were fully carried out:

You will impress upon every member of your party, who may be charged with any instrumental work, the necessity for *accuracy*. Our object is to obtain accurate and reliable data as far as we go, and every one should feel that ample time will be allowed him to conduct his observations with all possible care.

Description of the proposed canal.

The canal is divided for convenience of description into four divisions.

The "eastern division" extends from the Atrato River to the "basin" by which the canal crosses the Napipi to follow the Doguado, a distance of 20.6 miles. Throughout this distance it lies on the northern, or left, bank of the Napipi, except where that river has been diverted in some of its sharp bends to the northward. In this division there are to be placed, at convenient points, twelve locks, having a lift of 10.3 feet each, raising the water-surface of the canal from 19 feet, (the extreme low-water level of the Atrato,) to 143 feet, which is the height of the summit-level. Through the swampy region in the lower part of the route, the water-surface of the canal is kept below the ground-surface; but where the firm ground is reached, the water-surface is kept well above the ground, so that for nearly fourteen miles of the eastern division, more or less embankment is required. The cut in this division averages about 30 feet in depth. The necessary culverts and side-drains to accommodate the surface-drainage in this division have been estimated for, and will be found fully described under their proper heads.

The "middle division" extends from the basin, just mentioned, to the commencement of the tunnel. Its length is 4.8 miles. The "basin" is formed by a dam thrown across the Napipi below its junction with the Merindo. Beyond this basin the canal follows the Doguado River very closely, crossing it from time to time to keep the best ground. For the greater part of this division the cutting is very deep. The deepest cut is 245 feet, and the average for the division is 95 feet.

The "tunnel division" is 3.5 miles in length. Two plans are proposed for this tunnel. In one it is to be 118 feet high in the clear, 70 feet wide at water-surface, and to have 27 feet depth of water. The

other plan contemplates a tunnel of the same height, but reduce width to 60 feet at water-surface, and with 30 feet depth of water. both plans it is proposed to line it with an arch of masonry.

The "western division" extends from the western portal of the tu to 26 feet below low-water mark on the Pacific. Its length is 1.8 n This division includes a "pointing-basin" at the western end of tunnel, by which the necessary change of direction between the tu and the Pacific locks is to be effected. These locks are ten in num each having a lift of 14.9 feet, and they are placed so that one im diately follows the other—an arrangement necessitated by the extre steep character of the Pacific slope.

The entrance to the canal at Chiri-Chiri Bay is to be protecte proper breakwaters, and allowances have also been made for openi channel through the bar at the mouth of the Atrato.

Adding together the lengths of the four divisions as given above have as the total length of artificial cut required by this route, miles.

The following form and dimensions have been assumed as best su to meet the requirements of the case:*

	Fe
Width at bottom	7
Width at water-surface in earth-cuttings	15
Width at water-surface in rock-cuttings	9
Slope of sides in earth-cuttings	1
Slope of sides in rock-cuttings, below water	
Slope of sides in rock-cuttings, above water	
Width of top of embankments	
Slope of embankments, interior	1
Slope of embankments, exterior	
Width of "bench," (10 feet above water-surface)	
Width of locks, inside	6
Length of locks between miter-sills	40

II.—WORKS FOR PROTECTING THE CANAL FROM FLOODS, INCLU CULVERTS, SIDE-DRAINS, AND CHANNELS FOR DIVERTING NAPIPI, DOGUADO, AND CHIRI-CHIRI RIVERS.

It is obvious that in a country subject to such excessive rains as i one now under consideration, ample arrangements for providing fo surface-drainage, and insuring the permanency of the canal-work protecting them from floods, are of the first importance.

In considering this, as well as all other points involving the princ of engineering, I have consulted frequently with Mr. Menocal, late civil engineer of the Nicaragua and Panama expeditions, and am u many obligations to him for his readiness always to afford me required assistance. His time, however, was so fully occupied wit duties that I could not think it right to trespass upon it more than necessary for a general outline of what was required, and he cann held responsible as indorsing in detail the accompanying estimates.

In the swampy section of the route, near the Atrato, nothing seems possible in the way of drainage than what is already provide nature. In such a soil it would, of course, be impossible to carr water-surface of the canal above ground. The first section of the is therefore to be carried at such a depth as to insure 26 feet of wat the lowest stage of the Atrato. It extends as far as the hills, alr spoken of, in the center of the swampy section. There, it is suppos

* The dimensions are substantially the same as those adopted by Commander I his estimates for the Panama route.

rock foundation will be found, and two locks are introduced. These have a lift of 10.3 feet each, and raise the water-surface to 36.6 feet above mean tide, but still keep it below the ground surface. At half a mile to the westward of these hills, there occurs a decided rise in the general level of the ground, and this point may be considered as marking the limit of the morasses, though continuous hard dry ground is not found till beyond the Braso Muriel. At the rise just mentioned, lock No. 3 is situated. This raises the level 10.3 feet more, 46.9 feet in all, but the water-surface is still below the ground, and is kept below till the firm ground is reached.

The depth of water in the lowest level of the canal will, naturally, vary with the stage of the Atrato. In dry weather, both locks would be required. With a rise in the river, one or both could be left open; and during great rises it is probable that the entire portion below lock No. 3 is completely covered with a shallow sheet of water.

It is my belief, however, from my own observation and the testimony of the natives, that such inundations are not of long duration. The waters rise rapidly with extraordinary rains, and subside with equal rapidity to their normal wet-season stage, in which the rivers are confined to their proper beds, and the adjacent lands are uncovered. It is only the lowest portions, like the cienegas near the Atrato, that remain covered with water during the entire wet season. Whether or not these overflows would prove injurious to the canal, is a question for engineers. It appears to me that this portion of the canal could be regarded only as a channel-way to be dredged out to the required depth, and constant dredging would probably be required, for a long time at least, to keep it open.

It is proposed to close the Braso Muriel by a wall between the canal and the Napipi, thus stopping the flow of water from the river, and leaving the Braso to perform the functions of a drain. It would, perhaps, be a good plan to provide a cess-pool here, by means of which water might be taken into the canal during the dry season to supply the two lower locks.

After crossing this arm of the Napipi, and reaching the firm ground beyond, the question of surface-drainage assumes a new aspect. For nearly fifteen miles the canal-line runs along the left or northern bank of the Napipi, crossing the various streams, great and small, which drain the northern half of its valley.

There are two ways in which this drainage may be taken care of. If the canal be carried at a high level, the waters may be collected at convenient points by side-drains, and passed under the canal by culverts. If the canal be carried at a low level, a capacious channel must be constructed along its northern side, by which the waters will be conveyed to the Braso Muriel, and thence to the Atrato. Both plans involve great expense—the former for the necessary culverts, which must be massive works of solid hydraulic concrete; the latter for the enormous excavation required both in the main canal and in the side-channel.

In the plans herewith presented the two systems are combined.

Although four locks are introduced in the hills immediately beyond the Braso Muriel, raising the bottom of the canal to a height of 63.5 feet above mean tide, yet it is still kept sufficiently below the ground surface to require no culverts. This level is continued as far as the hills in "straight 4," a distance of some 15,000 feet, where lock No. 8 is introduced, and immediately beyond the lock comes culvert No. 1.

This culvert has tributary drains running both eastward and westward. The eastward drain extends to the hills in "straight 3," and from

the eastern slope of those hills a large drain is to extend to the E
Muriel.

From lock No. 8 to the crossing of the Napipi the bottom of the c
is kept well up, and the surface-water is collected at convenient p
by side-drains, and passed, by culverts, under the canal into the Na
These culverts number twelve in all. They are to be massive struct
of solid hydraulic concrete, with the same internal form and dimens
as the ordinary prism of the canal in rock-cuttings. The arches b
for affording passage to the water are semi-elliptical in shape, and
vary in number from 1 to 14, according to the requirements of the

In the valley of the Doguado the bottom of the canal is always s
below the level of the river as to make anything in the way of cul
out of the question. Ample side-drains have therefore been all
for, by which the drainage of this section will readily find its wa
the basin.

In the valley of the Chiri-Chiri one culvert has been allowed for,
the necessary drains to carry the drainage of the remaining po
directly into the Pacific.

Diversion of the Napipi, Doguado, and Chiri-Chiri Rivers.

In three places, the canal-line, in order to avoid high land or
detours, has been carried across the Napipi in its sharp northern b
In these cases estimates have been made for the necessary diversic
the river by artificial channels, as well as for the necessary walls o
verts for carrying the canal across the depression of the present
In one case advantage has been taken of the bend to form a sidin
turn-out, and the necessary allowance for this is included in the
mates.

In the valley of the Doguado, in order to keep the lowest ground
canal-line is obliged to follow the river very closely, crossi
frequently. In all these cases allowances have been made for the
essary diverting-channels.

In the valley of the Chiri-Chiri allowances have been made
channel to carry the waters of that river around the "pointing b
which is situated immediately beyond the western portal of the tu

The items of expense for all these works will be found fully set
in the synopsis of estimates appended to this report. The follo
will show at a glance the estimated cost of the works deemed nece
to a proper protection of the line from floods:

Culverts	$3,0
Drains	2,4
Diversion of the Napipi	5
Diversion of the Doguado	9
Diversion of the Chiri-Chiri	
	7,0
Add twenty-five per cent	1,7
	$8,8

III.—THE DAM AND BASIN FOR CROSSING THE NAPIPI RIVE

It has been stated, in the general description of the proposed c
that an essential feature in the plans suggested by Commander
fridge was the crossing of the Napipi by means of a dam.

My instructions from the Department contained particular directions to fix the proper location for this projected structure with precision.

The conditions of the problem are such as to point at once to the junction of the Merindo as the proper site for this dam, and a glance at our map will show that the topography of the locality is admirably adapted to the purpose.

A ridge of sufficient height, butting on the left bank of the Napipi a few hundred feet above this junction, and exposing a bluff of solid rock, affords a convenient abutment for the north end of the dam. Thence it extends across the bed of the river, which is here about 100 feet wide; across a low alluvial point lying between the two rivers; across the Merindo, which is about 50 feet wide and abuts at its south end against a ridge lying parallel to that stream and close to it.

The bed of the Napipi shows solid rock all the way across. A boring, obtained in the center of the alluvial point, showed bed-rock at the same level as that in the river, and I feel safe in assuming that a solid rock foundation will be found for the entire length of the dam. The solid rock is exposed on the bluff at the north end, and a careful examination of the ridge at the south end convinced me that rock exists there also at a depth of not more than 5 feet.

The extreme length of the dam on the crest will be 1,590 feet. The roots, which are supposed to be imbedded in the solid rock not less than 20 feet, are formed in steps, to follow the slope of the banks. On its foundation it has a length of 1,330 feet. This foundation is a solid bed of hydraulic concrete, 6 feet thick by 20 wide. On this rests the superstructure, which is formed of a shell of coursed masonry, in heavy blocks, with a hearting of solid concrete.

The dam is backed with a mass of clay and gravel, excavated from the basin behind it, and thrown up with a slope of 2 to 1. The front of the dam is formed in steps, to break the force of the overfall, and an apron of heavy timber, resting on bearing-piles and filled in below with broken stones, extends 55 feet down-stream. On each side a wall five feet higher than the crest of the dam confines the overfalling water to a width of 1,200 feet, and keeps it clear of the roots.

The total height of the dam above the bottom of the foundation is 33.2 feet. Its height above the mean level of the surface of the ground, in which it is imbedded for the greater portion of its length, is 20 feet. The width of the crest is 8 feet. It raises the waters of the Napipi 25 feet above ordinary dry-season stage.

In determining the height of this dam it was proposed to me, by Commander Selfridge, to make its crest as high as the level of the highest flood ever known on the Napipi, and to make it as long as possible in order that, during floods, there should be no great rise in the basin behind it, and, consequently, in the summit-level of the canal.

The height of the greatest flood was approximately marked on the wall of a native hut near the mouth of the Merindo. The old native who pointed out the mark said that the flood had occurred in November, and that it lasted but a few hours. Taking everything into consideration, I am compelled to doubt its ever having occurred at all, but the height indicated was a convenient one, and I therefore adopted it. It gives a dam of good length, and brings the bottom of the canal above the bed of of the river at the point of crossing. It brings the water-surface of the summit-level up to 141 feet above mean-tide. I subsequently determined, in view of the limited water-supply during the dry months, to make the dam 2 feet higher, thus giving a depth of 28 feet to the water in the basin and summit-level, and giving a reserve to draw upon in extraor

dinarily dry seasons without diminishing the depth below 26 feet. The summit-level of the canal, under ordinary conditions, becomes, therefore, 143 feet.

Provisions have been made for a rise of 5 feet above this height without injury to the canal-works. I do not consider it possible that such a rise as this can ever occur. The greatest rise that took place while we were in the country occurred on the 11th of April. It increased the hourly flow of the Napipi from 340,000 cubic feet on the 10th to 11,000,000 on the 11th, and it subsided again to 1,169,000 on the 12th. Such a flood, which would be of ordinary occurrence during wet seasons, would, according to the calculations of Mr. Menocal, raise the water but 1 foot above the crest of the dam. A flood of double that volume then, which would be uncommon, would raise it less than 2 feet, and that one should occur to raise it 5 feet, it is impossible to imagine.

A dam of the height here proposed would overflow an extent of country that I estimate roughly at one and one-half square miles. A careful line of levels was run up the beds of each of the tributary rivers, to the point to which its waters would be set back, and reconnaissances were made to develop the character of the country along their banks. The topography was found admirably adapted to the formation of a basin, no retaining walls being needed, except near the north end of the dam, and there for a very short distance.

The physical features of this locality render it expedient to bring the canal to the Napipi near the north end of the dam, and to leave it again near the mouth of the Doguado. It becomes, therefore, imperative to provide means for preventing the precipitation of débris brought down by floods into the canal-bed proper.

It is believed that the excavation of a basin of the form adopted (which it is difficult to explain intelligibly without the aid of a diagram) will effectually accomplish this object.

This basin will also form a commodious turn-out that will, I think, prove of great value in the actual operation of the canal.

IV.—THE TUNNEL AND THE "POINTING BASIN."

At a distance of 26,000 feet from the crossing of the Napipi, the cutting having attained a depth of 220 feet, and rapidly increasing, it is proposed to resort to a tunnel for carrying the canal under the dividing ridge, which here attains an elevation of 778 feet.

A tunnel starting at the point indicated, and coming out at a corresponding elevation in the valley of the Chiri-Chiri, would be three and five-tenths miles in length.

As no tunnel approaching the dimensions of the one here contemplated has ever yet been attempted, its necessary size and best form are altogether open questions. The question of its practicability has been fully discussed in the report of Commander Selfridge, and it appears to be conceded that, as a mere feat of engineering, its practicability cannot be doubted.

I propose to consider the tunnel question here, only so far as may be necessary to arrive at a fair approximation to its probable cost, as nearly as that may be done with the limited data we have to work upon. For this purpose I have calculated the cost with different dimensions, according to plans kindly furnished me by Mr. W. H. Hutton, an eminent civil engineer of Baltimore. He proposes two forms of transverse section, according to the nature of the material to be pierced. First, for good solid rock, a trapezoidal form with a segmental arch of 120°, the

wn to be 86 feet above water-line; a width of 70 feet at water-surface; lepth of 27 feet of water, and sides battered 1 to 20. The arch o be formed of masonry, 5 feet thick at the spring and 3 feet at the wn, the whole to be well backed by concrete. Second, for bad or sound rock, an elliptical section with a conjugate diameter of 70 feet the surface of the water, and a semi-transverse diameter of 86 feet ove water-level, the section being continued below to a depth of 27 t, as before. With this section the arched lining springs from the ter-surface with a thickness of 5 feet, diminishing to 3 feet at the wn. Both these sections give an area of 1,846 square feet to the ter-space.

'he first plan would require the excavation of 5,279,843 cubic yards 'ock, and 203,498 cubic yards of masonry would be required to form arched lining. Estimating the cost of excavation at $5.35 per cubic d, (the cost allowed by Commander Selfridge on the authority of Mr. H. Latrobe,) and the masonry at $20 per cubic yard, (for which mate I have the authority of Mr. Menocal and Mr. S. T. Abert, ited States civil engineer at Washington,) and we have the total cost al to $32,316,120. Adding to this $163,000 for the necessary shafts rough estimate—and we have $32,479,120.

'he second plan would require 5,102,862 cubic yards of excavation, 682,993 cubic yards of masonry. This, with the cost of shafts added, es $40,960,272.

'ur present knowledge of the nature of the rock is too limited to ble us to say which of these sections would be found best adapted. haps for the purpose of arriving at the approximate cost it would be to average the two sums given above. This gives as the cost of a tun- 70 feet wide at the water-surface, and 113 feet high, $36,801,196. If add to this the customary 25 per cent. for contingencies, we have ,001,496.

he necessity for a width of 70 feet at the water-surface is so strongly stioned by some that I have thought it best to calculate the cost of nnel with the forms of cross-section just described, but with the th reduced to 60 feet.

he height above water remains as before, but, in accordance with a gestion of Commander Selfridge, the depth has been increased to 30 . This gives additional water-space at a trifling comparative increase ost. With these dimensions the area of the water-space is 1,735 are feet. With these reduced dimensions the excavation in good would be 4,915,397 cubic yards, and the masonry required in the nental arch 199,181 cubic yards. At the prices already mentioned e figures give a cost of $30,443,994.

he elliptical section would require, with reduced width, the excava- of 4,562,051 cubic yards, and of masonry 573,494 cubic yards, giv- a cost of $35,876,853.

aking the mean of these two sums as before, we have as the cost of nnel 60 feet wide and with 30 feet of water the sum of $33,241,923. s, with 25 per cent. added, gives $41,552,404. In the final summing hereinafter given, this sum has been allowed. Those who consider idth of 70 feet as essential must add to the sum total there given 59,273.

The "pointing basin."

he general direction of the valley of the Chiri-Chiri River, in which proposed to place the Pacific locks, makes, as has already been ed, an angle of 40° with the line of the tunnel. On account of the

nature of the ground in the vicinity and the limited distance to the Pacific beach, it is impossible to introduce a curve for the purpose of making this change of direction, (unless it be introduced in the tunnel itself,) and no better plan has occurred to me than the "pointing basin," about to be described. This consists simply of an open cut, the ground-plan being very nearly in the shape of the sector of a circle. The radius is 400 feet and the chord 290 feet. As a portion of the summit-level of the canal, this basin has a normal depth of 28 feet of water. It is to be excavated mainly in the solid rock, and its side will have the same slope as similar cuttings in other portions of the work.

At a height of 8 feet above the normal water-level, a bench 10 feet wide extends around three sides to facilitate the operation of breasting over the passing ships to the required direction. The western side of this basin makes an angle of 5° with the direction of the tunnel, as a ship would be able to make that change of direction while emerging or entering, and such a plan reduces considerably the amount of excavation required. The principal objection to this basin, as it has been placed in these plans, is the very heavy cutting it will require. This might be greatly reduced by putting the basin a little farther down the valley, but this will lengthen the tunnel, and bring most of the locks entirely above ground, so that what would be saved in the basin would be lost in the locks, and, besides, the work would be very much weakened.

The operation of passing a ship through such a basin is too simple to require explanation. The time occupied could not be greater, and should be considerably less, than would be required for passing through one lock.

V.—LOCKS.

The summit-level of the proposed canal being 143 feet above the plane of mean tide, the necessary locks to overcome this difference of level have been projected and their probable cost estimated. A portion of this difference of elevation on the Atlantic side is already overcome by the height of the surface of the Atrato at the point where the canal leaves it. Our line of levels gave 39 feet as the elevation of the banks of the Atrato at that point. According to the best of our observations and the most trustworthy information we could obtain, the extreme variation in the level of the Atrato is 20 feet. Subtracting this from 39, we have 19 feet as the elevation of the surface of the Atrato at its lowest stage. I regard this as an extreme estimate. This elevation leaves 124 feet to be overcome by locks. For this purpose twelve locks, with a lift of 10.3 feet each, have been proposed, and calculations made for them according to their locations as shown on the profile. At one place there are two together, and at another four in a flight; the others occur singly.

The dimensions proposed are a length of 400 feet between miter-sills, and a clear inside width of 60 feet. The walls inside are perpendicular, but joined to the bottom by a circular arc described with a radius of 10 feet. When the lock is situated in solid rock, a thickness of three feet of concrete has been allowed for sides and bottom. When in earth, this is increased to 6 feet. When the walls rise above the surface of the ground, they are to be 6 feet wide on top, and slope off outside so as to give at every point a thickness equal to .75 of the height above. The lift-walls have a thickness of 15 feet, and ample chambers have been provided. The walls and bottoms are to be entirely in hydraulic concrete, the only dressed stone being 70 cubic yards in each lock for miter-sills. For gates, machinery, and apparatus for filling and emptying

: locks, I have allowed the same sums given by Mr. Menocal in Com-
nder Lull's report on Nicaragua. The aggregate cost of these twelve
ks is $2,511,552; or, with 25 per cent added, $3,139,440. This esti-
te does not include the cost of excavation, as that is already allowed
in the estimate for the division in which they occur.

On the Pacific side the entire difference of level of 143 feet has to be
ercome by locks. In fact, in order to enable ships of all classes to
er or leave the canal at all stages of the tide, some 6½ feet must be
led to this, the rise and fall of tide in Chiri-Chiri Bay being about
feet. We have, therefore, a difference of 149.5 feet to provide for,
l estimates have been made for ten locks with a lift of 14.9 feet each.
is lift may be regarded as excessive, but no more than ten locks can
placed "end on" between the tunnel and the beach. This crowding
so many locks together in a flight is, of course, objectionable, for
ny reasons, but the descent of the Pacific slope is so abrupt that it
not be avoided.

The risk of damage to the works from the enormous hydrostatic
essure would, of course, be considerable. To guard against accidents
m this cause, it would be necessary to search diligently for fissures
the rock, and stop them effectively. Lining the entire inner surface
the lock with concrete ought to prevent percolation entirely, and, to
ard still further against it, the thickness of the lift-walls in this flight
locks has been increased to 30 feet. In these locks the same dimensions
ve been allowed as on the Atlantic side, except the necessary increase
height on account of the greater lift. The aggregate cost of these
locks is $2,537,662, adding to which 25 per cent. we have $3,172,078.
e total cost of the twenty-two locks required by these plans then be-
nes $5,049,214; add 25 per cent., $1,262,304; total, $6,311,518.

VI.—CHARACTERISTICS OF THE STRATA REQUIRING EXCAVATION.

The importance of determining as accurately as possible the character
the strata through which the proposed cutting would have to be
ade, should this line be selected, was fully appreciated, and every effort
ade to secure reliable data bearing on the question. The results of
r efforts in this direction were not as satisfactory as I could wish, and
r data is meager.

The boring-apparatus with which we were supplied proved entirely
heavy and clumsy for our little force to operate satisfactorily. The
t that the screw was of solid steel 3 feet long and 3 inches in diameter
ll show at once how poorly calculated it was for our purpose. To say
thing of the difficulty of transporting it along the line, it was found
nost impossible with the weight and strength of four men to drive it
o the tenacious clays of that section; or, if it did advance a foot or
it was next to impossible, with our appliances, to draw it out again.
number of trials were made with it, with more or less success, and
n the necessity of putting all our force on the line of survey com-
lled us to abandon its use entirely.

It can easily be seen that it was useless to employ an officer and four
n all day in reaching a depth of 6 or 8 feet, when the character of the
l could be better ascertained to a greater depth by a simple inspection
the banks of the little streams crossing the line of survey. This
thod was therefore adopted, and some forty specimens of the soil, at
ths varying from 5 to 20 feet, were obtained. These specimens, with
eral of rock, were sent to Professor Henry, of the Smithsonian In-
tution, with a request that they might be examined and a report

made of their characteristics, but the press of official duties on the pa of the gentlemen connected with that institution has thus far prevent their examination. In the absence, therefore, of the opinion of an e pert, I can only give my own conclusions as derived from careful obser tion.

The thickness of the earth overlying the bed-rock was found, in a part of the line, to depend upon the distance of the nearest hills. the crests of the ridges, where the rock frequently cropped out, t thickness of earth averaged about 5 feet. In the intervening valleys increased to 10 or 15 feet, and in the bottom-lands rock would not found at 20 feet.

Above the junction of the Doguado the earth rarely exceeds 10 f in depth. In the swampy lands near the Atrato no approximation the depth at which the bed rock lies has been attempted.

Throughout the entire length of the line, if we except the swam the appearance of the soil is strikingly similar. Below the thin layer vegetable mould we found everywhere a remarkably stiff, tenacious cl blackish-red or blue in color, and generally free from admixture of sa It was this tenacious subsoil that so troubled us in boring. The fi two or three feet were passed easily enough, but in the clay below o experience was as has been related. Cutting through this clay wou probably be difficult and expensive. But, once cut, no better materi for a canal could be desired. The ditch and embankments would, I a confident, be practically impervious to water, and its great stiffne and tenacity would enable it to stand at a good slope, and to resi the wearing of heavy rains and the wash at the water-surface.

Wherever we found outcrops of the bed-rock, which were freque on the river-banks, it presented uniform characteristics. It was invar ably in a state of great disintegration, splitting up irregularly into sma fragments, often so soft as to resemble clay. On the faces of high cliffs th rock is continually breaking away and tumbling down. In some place I observed quite distinct traces of stratification, as though the rock wer metamorphic in character. On several of the bluffs were well-marke dikes of some harder rock than the main body of the cliff. Generall the rock was full of the irregular seams common to all trappean forma tions. Where worn and polished by the action of water, as in the rive beds, this rock appears extremely hard. In such cases it often has light color which causes it to resemble sandstone in appearance, thoug not in texture.

VII.—WATER-SUPPLY AND AQUEDUCT FROM THE RIO CUIA.

The essential question of an adequate water-supply received mo careful attention.

Immediately upon arriving at the junction of the Napipi and Merin Rivers, where headquarters were established on the 13th of Februar careful observations of the flow of the Napipi were commenced and co tinued daily with few interruptions till the 27th of April.

The cross-section of the river was measured with all possible accurac and the velocity of the current determined by experiments with a de cate "current-meter." A mean of several observations with this i strument was generally taken, and the area of the stream was mul plied by .84 of the velocity thus determined.

Our observations extended through one of the driest seasons ev known in that section. By referring to the meteorological report it w be seen that but 10.42 inches of rain fell during seventy-three days, a

.18 inches of this during the last nineteen days. The water-supply as etermined by us may, therefore, be safely accepted as the minimum. will give here in the form of a table the results of our observations. The third column of the table will be found to contain the estimated lelivery of the aqueduct from the Rio Cuia, which will be fully described farther on. This aqueduct is capable of delivering 12,000,000 cubic feet daily. Several measurements of the Cuia show it to be in volume about the equal of the Napipi. In estimating the daily supply, therefore, the aqueduct is supposed to be delivering its full capacity whenever the flow of the Napipi is above 12,000,000 cubic feet daily. Whenever the flow of the Napipi falls below that figure, the aqueduct is supposed to deliver a quantity equal to that supplied by the Napipi.

Table showing the estimated minimum water-supply. From observations during the months of February, March, and April, 1875. Lieut. S. C. Paine, U. S. N., observer.

Date.	Observed flow of the Napipi.	Estimated delivery of the aqueduct.	Total daily supply. Cubic feet.
February 13	12,143,050	12,000,000	24,143,050
14	13,866,410	12,000,000	25,866,410
15	12,945,410	12,000,000	24,945,410
16	14,267,930	12,000 000	26,267,930
17	12,007,010	12,000,000	24,007,010
18	11,118,940	11,118,940	22,237,880
19	12,882,050	12,000,000	24,882,050
20	11,007,380	11,007,380	22,014,770
21	11,007,380	11,007,380	22,014,770
22	10,848,460	10,848,460	21,696,520
23	10,890,620	10,890,620	21,781,240
24	10,895,830	10,895,830	21,791,660
25	10,846,820	10,846,820	21,693,640
26	10,327,940	10,327,940	20,655,880
27	9,883,150	9,883,150	19,766,300
28	9,883,150	9,883,150	19,766,300
March 1	8,947,200	8,947,200	17,894,400
2	8,916,720	8,916,720	17,883,444
3	8,885,420	8,885,420	17,770,840
4	8,411,760	8,411,760	16,823,520
5	8,411,760	8,411,760	16,823,520
6	8,382,240	8,382,240	16,764,480
7	8,382,240	8,382,240	16,764,480
8	8,382,240	8,382,240	16,764,480
9	8,382,240	8,382,240	16,764,480
10	8,382,240	8,382,240	16,764,480
No observation till 26th.			
March 26	8,681,280	8,681,280	17,360,560
27	8,217,840	8,217,840	16,435,680
28	7,785,120	7,785,120	15,570,240
29	7,785,120	7,785,120	15,570,240
30	7,785,120	7,785,120	15,570,240
31	7,785,120	7,785,120	15,570,240
April 1	7,785,120	7,785,120	15,570,240
2	7,776,440	7,776,440	15,552,880
3	7,344,240	7,344,240	14,688,480
4	7,344,240	7,344,240	14,688,480
5	7,344,240	7,344,240	14,688,480
6	7,200,000	7,200,000	14,400,000
7	6,552,000	6,552,000	13,104,000
8	6,192,000	6,192,000	12,384,000
9	5,814,960	5,814,960	11,269,920
10	8,160,000	8,160,000	16,320,000
11	267,960,960	12,000,000	279,960,960
12	28,067,480	12,000,000	40,067,480
13	26,160,000	12,000,000	38,160,000
14	57,757,680	12,000,000	69,757,680

Table showing the estimated minimum water-supply—Continued.

Date.		Observed flow of the Napipi.	Estimated delivery of the aqueduct.	daily Cu
April	15	78,960,000	12,000,000	9
	16	98,967,890	12,000,000	11
	17	36,319,680	12,000,000	4
	18	52,560,000	12,000,000	6
	19	67,852,800	12,000,000	7
	20	20,160,000	12,000,000	3
	21	12,263,040	12,000,000	2
	22	11,520,000	11,520,000	2
	23	10,787,040	10,787,040	2
	24	22,275,360	12,000,000	3
	25	18,960,000	12,000,000	3
	26	15,600,000	12,000,000	2
	27	12,199,680	12,000,000	2

The above table shows the water-supply that can be count with certainty as fully as need be. To it must be added the re the basins that can be drawn upon when required. This reserv mate roughly at 150,000,000 cubic feet.

As a final resort, there remains the river Opogado, next to th ward of the Napipi. No survey has ever been made for an a between these rivers, but, from general knowledge of the t phy of the vicinity and the results of our survey to the Cuia, I say that an aqueduct could be built to the Opogado at a cost ceeding $1,000,000, and that 12,000,000 cubic feet daily could b to the supply.

The question of water-supply without recourse to the Opogad sider very fairly settled. The question of the *sufficiency* of this s have not been able to answer with any satisfaction to myself.

Not only is the amount of shipping that would seek the can gether uncertain; but, granting that we knew with reasonable a the amount of tonnage to be accommodated, the amount of would demand would depend altogether on the shape in whic sented itself.

The projected locks will accommodate with ease a ship of 5,0 or two of 2,000 each, or three or four small craft. If, there shipping present itself in such a way that the full capacity locks can be utilized, it would require, to accommodate the 3 tons that it is supposed would pass through the canal yearly, (93, Report of Commander Selfridge,) only about 2,500,000 cubi water daily—losses from all causes not being for the present con

If, on the other hand, the vessels should be mainly of small s present themselves for passage singly, it would require, for t amount of tonnage, three or four times that amount of water may assume that, on an average, 1,000 tons of shipping—whethe or more vessels—will pass through the canal at each lockage, calculate as follows, for double the amount of shipping just ref

It requires no argument to show that, in a canal fed exclusiv the summit, and without devices for effecting a saving of wate flights of locks, economy in expenditure of water would requ ships should pass in either direction in trains. Such an arra would be convenient, and, perhaps, necessary on other conside and we will proceed on the supposition that an arrangement is i tion to pass eight ships of a thousand tons each in each directi

The first ship passing to the westward will find the Atlantic locks empty, they having been so left by the last ship passing eastward, and at each of these twelve locks she will require one lockful of water, which must, of course, be drawn from the summit. On passing into the Pacific locks she will find them all full, and from the summit-lock she will send back into the summit-level a quantity of water equal to her displacement, and descend without further draft on the supply. Her successors passing in the same direction will find these conditions reversed. They will find the Atlantic locks full, and will ascend to the summit with the expenditure of one lockful of water. They will find the Pacific locks empty, but will descend with one lockful each, less displacement, as before. The eight ships passing westward have, therefore, expended nineteen Atlantic lockfuls plus eight Pacific lockfuls, less their aggregate displacement. These having passed, the transit of those bound eastward will begin. The first of these will find the Pacific locks empty, and will require at each one lockful. She will find the Atlantic locks full, and will descend with one lockful, less her displacement. Her successors will ascend to the summit with one Pacific lockful and descend with one lockful each, less displacement. This may be tabulated and rendered clearer, as follows:

Direction in which bound.	Atlantic.	Pacific.
First vessel passing westward	12 l	l' — d
Seven following successively	7 l	7 l' — 7 d
Expenditure for 8 vessels westward	19 l	8 l' — 8 d
First vessel passing eastward	l — d	10 l'
Seven following successively	7 l — 7 d	7 l'
Expenditure for 8 vessels eastward	8 l — 8 d	17 l'
Daily expenditure for 8 vessels each way	27 l — 8 d	25 l' — 8 d

The expression for the expenditure of water for 16 vessels, supposing passed each way, becomes 27 $l.$ + 25 $l'.$ — 16$d.$

It is, however, evident that economy in the expenditure will result from passing as many vessels as possible successively in the same direction. It would be advantageous, then, as far as water is concerned, to set apart alternate days for passing in either direction. On this supposition our expenditure for 16 ships becomes as follows:

Direction in which bound.	Atlantic.	Pacific.
First vessel passing westward	12 l	l' — d
Fifteen following successively	15 l	15 l' — 15 d
Expenditure for 16 vessels westward	27 l	16 l' — 16 d
First vessel passing eastward	l — d	10 l'
Fifteen following successively	15 l — 15 d	15 l'
Expenditure for 16 vessels eastward	16 l — 16 d	25 l'
Daily average	21.5 l — 8 d	20.5 l' — 8 d

The expression, then, for 16 vessels each way on alternate days becomes $21.5\,l + 20.5\,l' - 16\,d$. In this expression the value of l is 247,200 cubic feet; the value of l' is 357,600; and the value of d is supposed to average 32,260 cubic feet. Substituting these values we have $5{,}314{,}800 + 7{,}330{,}800 - 516{,}000 = 12{,}129{,}600$ cubic feet as the daily expenditure necessary to accommodate 6,000,000 tons of shipping yearly.

The above calculations are founded on the supposition that the tonnage seeking passage shall present itself in equal portions on each day throughout the year. No such favorable conditions could, of course, obtain in actual practice. It would, therefore, be an essential factor in any accurate estimate of the adequacy of the water-supply to know the distribution of the shipping according to months. In all months of the year except March, April, August, and, possibly, September, the supply would be ample. It would, then, be essential to know whether the press of business would be likely to occur during these months, or whether the monthly average would be practically the same the year round.

We must now consider a still more uncertain factor in our calculations, that of *waste* from all causes. The evaporation may be closely approximated. The experiments of Commander Selfridge give a loss from this cause of two-tenths of an inch daily, and 500,000 cubic feet would be a liberal allowance for evaporation from the whole canal. But I have been totally unable to arrive at any estimate of the probable loss from *leakage* and *filtration*. With the canal in rock, and the impervious clays of that region, and with all locks and culverts constructed of solid hydraulic concrete, the loss from these causes should be reduced to a minimum. But, having shown the supply that may be relied upon and the probable demand for passing ships, I will leave the question as to whether the margin is sufficient to cover the losses from all causes to those more competent to decide it.

It should not, however, it seems to me, be forgotten, as far as filtration is concerned, that, as pointed out by Commander Lull, in a canal with as many deep cuts in it as has the one in question, more water would be likely to filter *into* the canal than *out* of it.

Aqueduct from the Rio Cuia.

Finding, as has been stated, that the flow of the Napipi was proving entirely insufficient to supply the projected canal, I took the earliest opportunity to run a line of survey to the Cuia for a feeder.

Such an aqueduct had been proposed by Commander Selfridge, and, under his direction, a survey had been made in 1873 from the Cuia to the Napipi, some distance below the junction. That survey demonstrated the practicability of feeding from the Cuia; it remained for us to make such additional examination as was necessary to obtain the data from which to estimate the character and probable cost of the work.

Such a survey was accordingly made. It showed the ordinary dry-season stage of the Cuia, at the point where we wished to tap it, to be 30 feet above the Napipi. The dam for crossing the latter river, however, raises its water 25 feet, leaving a margin of 5 feet. I propose to raise the Cuia by a dam 9 feet, thus giving a working head of 14 feet.

It is unnecessary to enter here into a detailed description of the works necessary for this aqueduct. The dam, just alluded to, across the Cuia, is 770 feet long. By it the waters are backed up in the main river and in a large tributary, the Salado, which comes in on the left bank just

above the dam. From this tributary the waters are carried by an open cut of 5,700 feet and a tunnel of 5,800 feet, to the valley of the Cuita, which flows into the Napipi some miles below the proposed dam and basin. At a convenient point another dam 500 feet long and 20 feet high is to be thrown across the valley of this stream, and the waters of this basin will be carried into the main basin by an open cut of 2,220 feet and a tunnel of 3,430 feet. We have, then, as the total length requiring excavation—

	Feet.
Open cut	7,720
Tunnel	9,230
Total	16,950

Or about 3.2 miles. A fall of 14 feet in 3.2 miles gives a grade of 4.3 feet to the mile. The mean velocity of the current will be 4.3 feet per second, which would be excessive were it not that the cutting is entirely in rock.

For the proper dimensions and best form for the aqueduct I am indebted to Mr. Menocal. The cut is to be 6.5 feet wide at the bottom, and sides to slope 1 to 1. When the water in the basins stands level with the crests of the dams, the depth in the aqueduct will be 3.5 feet, and under these circumstances it will deliver 150 cubic feet per second, or 12,960,000 cubic feet daily.

Where the open cutting exceeds 50 feet in depth, tunneling has been proposed. The transverse section of the tunnel consists of the trapezoidal form already described, surmounted by a semicircular arch. This gives a total height of 10.25 feet, and width at water-surface of 13.5 feet. It has been assumed that the rock, in a tunnel of such small dimensions, will sustain itself without lining.

Mr. Menocal estimates the probable loss from evaporation and filtration at 75,000 cubic feet daily. But it will be remembered that in estimating the delivery of the aqueduct the Cuia alone has been considered. I estimate the minimum flow of the brook Cuita at not less than 500,000 cubic feet daily, which ought to be sufficient to cover all losses and leave a wide margin.

It is proper to say that, after all the surveys had been completed and plotted and the topography sketched in, it was found expedient to deviate considerably from the surveyed line when projecting the aqueduct.

Wherever such deviations have been made the height has been assumed to be so great as to require tunneling, so no doubt can exist but that the actual conditions are, if anything, more favorable than those assumed.

VIII.—METEOROLOGY AND CLIMATE.

It is unnecessary for the purpose of this report to enter into any extended discussion of questions arising under this head.

During our entire stay meteorological observations, with such instruments as we had at hand, were regularly conducted under the supervision of Lieut. S. C. Paine, and he has prepared a report showing in tabular form, as also graphically, by a projection of the curves, the daily rain-fall, direction of the wind, state of weather, five daily readings of the barometer and wet and dry bulb thermometer, and the relative humidity.

A thermometer exposed to the sun was also observed, in order to show the heat to which laborers would be exposed. These observations gave a mean of 97° F. as the midday temperature, the minimum being 82° and the maximum 114°. It should be stated that 114° was the limit

of the graduation of the thermometer, and on one or two occasions it appeared that the mercury would have gone higher if permitted.

The prevailing winds at the junction of the Napipi and Merindo were from the southward. Nearly every day we had a refreshing breeze from this quarter, springing up about 10 a. m. and lasting till nearly sundown. During the three seasons that I have spent in that locality I have never known a violent wind.

During our stay, from the 13th February to the 28th April, we had a total rain-fall of 10.42 inches, distributed as follows:

		Inches.			Inches.
Feb.	15	0.04	April	18	0.56
	23	0.66		19	0.48
March	10	0.51		21	0.15
	19	0.04		23	0.34
	20	0.31		24	0.15
	22	0.71		25	0.44
April	9	0.25		26	0.04
	11	1.84		27	0.16
	14	0.61		28	0.20
	16	3.16			

It will be observed that during seventy-four days rain occurred on nineteen only, and that up to the 9th of April, (which may be considered as marking the setting in the rainy season,) a period of fifty-five days, rain had occurred on six days only. Of the entire observed rain-fall, 10.42 inches, 8.18 inches fell after the 9th of April. The greater part of the rain fell during the night.

In general no such period of drought as this occurs, and the natives told me that during the previous year there was no distinctly marked dry season at all.

But, as a rule, two well-marked dry seasons are experienced here with corresponding periods of rain. January, February, and March are the months which constitute the driest and pleasantest season. In April the rains commence, and in May and June they are very heavy. In July a second dry season begins to set in, and August and September are generally pleasant and comparatively dry. In October rains again commence, and in November and December they are at their heaviest.

Briefly, then, five months of the year are dry and seven wet, while occasional years may be expected with little or no dry season, properly so called.

Regarded from a sanitary point of view, it would appear that this climate is quite as healthy as any within the tropics. Up to the time that work was begun in the swamps, the health of the members of the expedition was uniformly good. With the exception of a strip five or six miles wide near the Atrato, I consider that the projected line lies through a healthy region. In the more elevated portions, where exposure to the sun during the middle of the day can be avoided, the climate during the dry season is simply delightful. Those members of the expedition whose labors were mainly confined to this portion escaped all sickness.

The experience of all the expeditions, goes to show that, with good food, good shelter at night, flannel clothing, and proper attention to cleanliness, men can endure great labor in that country. It was only when the exigencies of the survey prevented the fulfillment of these conditions that sickness occurred. I do not see why, during the construction of a canal, they may not all be fulfilled much more effectively than our circumstances permitted.

Attention to these details would be of paramount importance anywhere

within the tropics. The laborers must be well fed, well clothed, and well sheltered in commodious quarters, situated with special reference to sanitary conditions rather than the convenience of getting to and from work. Proper hospitals must be provided and the little ailments promptly treated; opportunity to indulge to excess in spirituous liquors must not be allowed; and, in a word, the laborers must be treated as *men* worth caring for; otherwise the opening of a canal on any of the projected lines will cost as many thousands of lives as millions of dollars.

IX.—MATERIALS FOR CONSTRUCTION.

As the projected canal-line lies through an unbroken primeval wilderness and our observations extended over a very limited area, our knowledge of its capability of affording the requisite materials for the construction of the canal is very imperfect.

We know, however, that everywhere out of the swamps the country is well covered with very large timber. I obtained some thirty specimens of wood of different varieties, many of which are very beautiful. They are now in the hands of Chief Constructor Hanscom, for an expression of his opinion as to their value for the various purposes for which timber may be employed.

In regard to other materials, such as rock, sand, clay, &c., I cannot do better than quote from the report of the geologist who accompanied Lieutenant Michler on his survey of the Truando in 1857. The Truando is a tributary of the Atrato, similar to the Napipi, and less than one hundred miles to the northward. While it is not by any means certain that the geological character of the two localities is the same, I see no reason for supposing that they are very different. At all events I give the following, in the absence of any more definite information:

In regard to the probable degree of development and the respective extent of each of the strata constituting the isthmus, we are not able to go beyond certain conjectures, especially so in its western portion. So far as sedimentary strata are concerned, a proposed cutting through will meet with no serious obstacles, while at the same time this section will furnish choice material for building-purposes. Calcareous rock may be expected almost to a certainty within the bounds of the tertiary and secondary formation, while the quaternary, and alluvium in general, will readily yield plastic clay and clean drift-sand. Heavy rock for foundations and cyclopean work generally will be furnished by the trappean series.

I have already mentioned the stiff, tenacious character of the clays of the country, rendering them excellent material for embankments, and in several places we met a smooth blue clay exactly suited for "puddle." Near the mouth of the Merindo there are banks of a fine whitish clay, used by the natives for the manufacture of tobacco-pipes, as well as in rude attempts at pottery.

X.—HARBORS.

I was not directed in my instructions to seek for any additional information concerning harbors, and have none to present. I consider them simply to arrive at an estimate of the cost of whatever improvements they may require, as an important item in the sum total required for a canal by this route.

It is evident that, as a harbor, the Gulf of Urabá requires no improvement. But a channel must be kept open through the bar at the mouth of the Atrato, if that river is to be used as is proposed in this canal-scheme. Commander Selfridge has proposed to effect this by confining the current by jetties extending across the bar, as is now being done at

the mouth of the Mississippi. Taking the practicability of this as granted, I will try to arrive at its probable cost.

For the purpose of confining the current, as is here proposed, a substantial wall must be erected on either side. A single row of piles would be speedily washed out. I have, therefore, estimated for a wall on each side of the channel, according to plans proposed by Mr. Menocal. Each wall is to consist of two rows of sheet-piles, 30 feet apart. In the space thus inclosed are to be driven two rows of long piles, 10 feet apart, in the direction of the width of the wall and 5 feet apart in the direction of its length. These are all to be firmly bound together by longitudinal and transverse stringers, and the inclosed space filled with clay and fascines. A wall of this character would, it is believed, result in the formation of a permanent bank. It is probable that they would have to be extended from time to time. A similar wall would be required to close up such other mouths of the delta as might be necessary to give proper strength to the current.

For all this work and the necessary dredging, estimates will be found in the synopsis. The estimate is, of necessity, rough. The cost amounts to $817,780, adding to which 25 per cent. we have $1,022,225.

The reconnaissance of Commander Lullshows so conclusively that the Atrato from its mouth to the Napipi requires no improvement, that it is unnecessary to do more than allude to the subject here.

Chiri-Chiri Bay.

This proposed terminus on the Pacific side is simply an indentation in the coast, open to all winds from northwest to south-southwest. The survey made by the officers of the United States steamer Tuscarora, in 1873, shows the water to deepen rapidly, the 5-fathom line being but about 1,300 feet from low-water mark.

The bottom is mainly sand, and affords good holding-ground. Violent gales are of extremely rare occurrence in that locality, and no trouble would be likely to be experienced for the want of a more land-locked harbor at that terminus.

A very heavy surf rolls in on the beach at all times, occasionally rendering landing a hazardous operation. To protect the entrance to the canal from this surf, and to afford a refuge for disabled vessels, it is proposed to form a basin by two moles or breakwaters. The longer of these two starts from the shore to the northward of the canal and bends around to the southward, so as to protect the entrance from the swell that sets in parallel to the general direction of the coast. The shorter one projects from the shore to the southward of the canal, extending to the 5 fathom line. This is intended to intercept, as far as possible, the swe that may be reflected around the end of the long mole.

The water deepens so rapidly that, in order to secure a proper width to the entrance, the head of the long mole has to be extended to the 8 fathom line. This great depth necessitates an enormous mass of material. Calculations give the amount of 861,200 cubic yards as necessary for the two moles.

This material will be taken from the excavations of the Pacific slope and the western end of the tunnel. The sums already allowed for excavating this material are supposed to include the cost of dumping it at the most convenient points. In allowing, then, for the cost of the breakwaters, we must consider what additional sum will cover the extra expense of dumping it exactly where wanted to give the required shape and slope. For this purpose $2.50 per cubic yard is supposed to be

. At this price, the cost of the moles becomes $2,163,000; add nt., $540,750; total cost, $2,703,750.

XI.—SYNOPSIS OF ESTIMATES.

Lengths and limits of divisions.

	Miles.
vision from Atrato to basin	20.63
ision from basin to tunnel	4.82
ision	3.50
vision from tunnel to Pacific	1.30
l length of canal	30.25

ESTIMATED COST OF CANAL.

Eastern division.

ıbic yards excavation in earth, at 35 cents	3,167,402
ıbic yards excavation in rock, at $1.25	5,016,180
ıbic yards excavation in rock, at $1.50	2,006,472
ıbic yards embankment, at 10 cents	308,252
	$10,498,30

: No. 1:

yards hydraulic concrete, at $7.75	64,689
ırds dressed stone in miter-sills, at $18	1,260
ipes	31,968
	7,929
n pipes	7,608
;es, &c	30,000
	$143,454

: No. 2:

yards hydraulic concrete, at $7.75	64,689
s as in lock No. 1	78,765
	$143,454

: No. 3:

c yards hydraulic concrete, at $7.75	147,079
s as in lock No. 1	78,765
	$225,844

: No. 4:

c yards hydraulic concrete, at $7.75	135,199
s as in lock No. 1	78,765
	$213,964

: No. 5:

c yards hydraulic concrete, at $7.75	165,695
s as in lock No. 1	78,765
	$244,460

: No. 6:

c yards hydraulic concrete, at $7.75	202,004
s as in lock No. 1	78,765
	$300,769

Lock No. 7:	
8,347 cubic yards hydraulic concrete, at $7.75	64, 6
Other items as in lock No. 1	78, 7
	$143, 4
Lock No. 8:	
8,296 cubic yards hydraulic concrete, at $7.75	64, 2
Other items as in lock No. 1	78, 7
	$143, 0
Lock No. 9:	
24,728 cubic yards hydraulic concrete, at $7.75	191, 64
Other items as in lock No. 1	78, 76
	$270, 40
Lock No. 10:	
41,007 cubic yards hydraulic concrete, at $7.75	317, 80
Other items as in lock No. 1	78, 765
	$396, 569
Lock No. 11:	
8,296 cubic yards hydraulic concrete, at $7.75	64, 294
Other items as in lock No. 1	78, 765
	$143, 059
Lock No. 12:	
8,296 cubic yards hydraulic concrete, at $7.75	64, 294
Other items as in lock No. 1	78, 765
	$143, 059
Total cost, twelve locks	2, 511, 55
Culvert No. 1:	
17,200 cubic yards excavation in earth, at 35 cents	6, 02
39, 200 cubic yards hydraulic concrete, at $8	313, 6
	$319, 6
Culvert No. 2:	
30,070 cubic yards excavation in earth, at 35 cents	10,
51,280 cubic yards hydraulic concrete, at $8	410,
	$420,
Culvert No. 3:	
14,050 cubic yards excavation in earth, at 35 cents	
27,090 cubic yards hydraulic concrete, at $8	21
	$
Culvert No. 4:	
8,360 cubic yards excavation in earth, at 35 cents	
40,030 cubic yards hydraulic concrete, at $8	
Culvert No. 5:	
15,330 cubic yards excavation in earth, at 35 cents	
25,410 cubic yards hydraulic concrete, at $8	

; No. 6:

ards excavation in earth, at 35 cents	5,656
ards hydraulic concrete, at $8	133,920
	$139,576

; No. 7:

ards excavation in earth, at 35 cents	11,718
ards hydraulic concrete, at $8	224,800
	$236,518

t No. 8:

ards excavation in earth, at 35 cents	9,474
ards hydraulic concrete, at $8	201,200
	$210,674

; No. 9:

ards excavation in earth, at 35 cents	10,745
ards hydraulic concrete, at $8	201,040
	$211,785

; No. 10:

'ards excavation in earth, at 35 cents	9,590
ards hydraulic concrete, at $8	207,440
	$217,030

; No. 11:

ards excavation in earth, at 35 cents	4,200
ards hydraulic concrete, at $8	92,720
	$96,920

, No. 12:

ards excavation in earth, at 35 cents	14,014
'ards hydraulic concrete, at $8	391,360
	$405,374
ɔst twelve culverts	3,011,493

ains:

yards excavation in earth, at 30 cents	222,150
yards excavation in rock, at $1.25	598,125
	$820,275

. of Napipi River:

5, 950 feet.

ards excavation in earth, at 30 cents	7,344
yards excavation in rock, at $1.25	278,320
	$285,664

'aso Muriel, 1,650 feet:

ards excavation in earth, at 30 cents	$14,960

es Nos. 6 and 7, 1,250 feet:

ards excavation in earth, at 30 cents	10,502
ards excavation in rock, at $1.25	34,255
ards hydraulic concrete, at $8	98,800
	$143,557

At straight No. 10, 300 feet:

28,322 cubic yards excavation in earth, at 30 cents	8,496
14,880 cubic yards hydraulic concrete, at $8	119,040
	$127,536
Total cost diverting Napipi	$571,717

Siding at curve No. 5:*

7,440 cubic yards concrete, at $8	$59,520

Recapitulation of cost of eastern division.

Excavation and embankment	10,498,304
Lift-locks	2,511,555
Culverts	3,011,49[illegible]
Drains	820,27[illegible]
Diversion of Napipi	571,7[illegible]
Siding	59,52[illegible]
Grubbing and clearing	149,80[illegible]
	$17,642,66[illegible]

Middle division.

1,082,559 cubic yards excavation in earth, at 35 cents	378,895
4,827,800 cubic yards excavation in rock, at $1.25	6,034,750
4,827,800 cubic yards excavation in rock, at $1.50	7,241,700
	$13,655,345

Side drains:

180,105 cubic yards excavation in earth, at 30 cents	54,031
833,746 cubic yards excavation in rock, at $1.25	1,042,182
277,915 cubic yards excavation in rock, at $1.50	466,862
	$1,563,075

Diversion of Doguado River:

98,913 cubic yards excavation in earth, at 30 cents	29,674
585,940 cubic yards excavation in rock, at $1.25	615,237
198,620 cubic yards excavation in rock, at $1.50	297,930
1,587 cubic yards dry stone wall, at $4	6,348
	$949,189

Basin:

1,404,179 cubic yards excavation in earth, at 35 cents	491,463
1,140,712 cubic yards excavation in rock, at $1.25	1,425,890
	$1,917,353

Dam No. 1, (across Napipi below the Merindo:)

188,855 cubic yards excavation in earth, at 35 cents	$66,099
185,625 cubic yards excavation in rock, at $1.25	232,031
9,709 cubic yards coursed masonry, at $15	145,633
5,920 cubic yards hydraulic concrete in foundation, at $7	41,440
12,279 cubic yards hydraulic concrete in hearting, at $8	98,232
200 cubic yards dry-stone wall, at $4	800
9,200 cubic yards stone-filling under apron, at 50 cents	4,600
79,000 cubic feet timber in apron, at 30 cents	23,700
880 piles 8 feet long, at $4	3,520
	$616,057

* The excavation for this siding is included in the estimate of excavation for the division.

Recapitulation of cost of middle division.

Excavation and embankment	15,572,698
Drains	1,563,075
Diversion of Doguado	949,189
Dam No. 1	616,057
Grubbing and clearing	34,900
	$18,735,919

Tunnel.

Plan A, 60 feet wide, 30 feet water.

1st. For bad rock, with elliptical arch springing from water-surface:

4,562,051 cubic yards excavation, at $5.35	24,406,973
573,494 cubic yards masonry, at $20	11,469,880
	$35,876,853

2d. For good rock, with segmental arch of 120° springing at 67 feet from water-line; sides battered from 1 to 20:

4,915,397 cubic yards excavation, at $5.35	26,297,374
199,181 cubic yards masonry, at $20	3,983,620
	$30,280,994

Plan B, 70 feet wide, 27 feet water.

1st. For bad rock as above:

5,102,862 cubic yards excavation, at $5.35	27,300 312
682,993 cubic yards masonry, at $20	13,659,960
	$40,960,272

2d. For good rock, as above.

5,279,843 cubic yards excavation, at $5.35	28,246,160
203,498 cubic yards masonry, at $20	4,069,960
	$32,316,120

Shafts.

16,300 cubic yards excavation in rock, at $10	$163,000

Western division.

178,002 cubic yards excavation in earth, at 35 cents	62,300
585,604 cubic yards excavation in rock, at $1.25	732,005
860,063 cubic yards excavation in rock, at $1.50	1,290,094
53,900 cubic yards excavation in earth below water, at 50 cents	26,950
103,009 cubic yards excavation in rock below water, at $5	515,045
	$2,626,394

Ten lift-locks.

225,808 cubic yards hydraulic concrete, at $7.75	1,750,012
Gates, valves, pipes, machinery, &c	787,650
	$2,537,662

Side drains.

56,866 cubic yards excavation in earth, at 30 cents	17,060
39,634 cubic yards excavation in rock, at $1.25	49,542
	$66,602

Diversion of Chiri-Chiri River.

71,787 cubic yards excavation in rock, at $1.25	$89,733

Culvert No. 13.

2,489 cubic yards hydraulic concrete, at $8	$19,9[illegible]

Recapitulation of cost of western division.

Excavation and embankment	2,626,3[illegible]
Lift-locks	2,537,6[illegible]
Drains	66,6[illegible]
Diversion of Chiri-Chiri	89,7[illegible]
Culvert	19,9[illegible]
Grubbing and clearing	7,2[illegible]
	$5,347,5[illegible]

Aqueduct.

107,311 cubic yards excavation in rock, at $1.25	134,1[illegible]39
36,441 cubic yards tunnel, at $8	291,5[illegible]28
	$425,[illegible]67

Dam No. 2, across brook Cuita:

2,623 cubic yards excavation in earth, at 35 cents	[illegible]18
2,109 cubic yards hydraulic concrete, at $8	16,872
1,598 cubic yards masonry, at $15	23,970
10,000 cubic yards rip-rap for apron, at $1	10,000
	$51,760

Dam No. 3, across Cuia River:

2,736 cubic yards excavation in earth, at 35 cents	957
2,000 cubic yards excavation in rock, at $1.25	2,500
3,149 cubic yards hydraulic concrete, at $8	25,192
2,152 cubic yards masonry, at $15	32,280
10,370 cubic yards rip-rap for apron, at $1	10,370
	71,299
Total cost of aqueduct	$548,726

Harbor-improvements.

Breakwaters at Chiri-Chiri Bay:

861,200 cubic yards stone, at $2.50	2,163,000
Light-house	30,000
	$2,193,000

Improvement at mouth of Atrato:

880,000 cubic yards dredging, at 50 cents	440,000
17,978 piles, at $5	89,900
176,000 cubic yards filling, at $1	176,000
38,600 cubic feet timber, at 30 cents	11,880
Obstruction of other mouths	100,000
Light-house	30,000
	$847,780

Final recapitulation.

Excavation and embankment	28,697,398
Tunnel	33,241,923
Locks	5,049,214
Culverts	3,031,405
Side-drains	2,449,953
Dam for crossing Napipi	616,057
Aqueduct from Rio Cuia	548,726
Diversion of rivers	1,670,159
Grubbing and clearing	191,900

Breakwaters at Chiri-Chiri	2,613,000
Improvements at mouth of Atrato	817,780
Light-house at each terminus	60,000
	$78,557,515
Add 25 per cent. for contingencies	19,639,379
Total estimated cost of canal	$98,196,894

XII.—LOCAL ADVANTAGES AND DISADVANTAGES; GENERAL REMARKS.

The closing paragraph of my instructions required me to ascertain, as closely as possible, whatever local advantages or disadvantages might exist, favoring or interfering with, the construction of a ship-canal.

Compliance with this order does not require me to enter into any statement of comparative advantages and disadvantages, but simply, taken in it broadest sense, to present my views as to what condition would be likely to be found favorable to the construction, maintenance, and successful operation of a canal by this route, and what unfavorable, exactly as though it were the only route in existence.

The following are all that have occurred to me with what attention I have been able to give the subject. Those accustomed to the contemplation and execution of great engineering schemes will doubtless see many more on both sides, while it is quite certain that, in the actual execution of the work, many contingencies and complications will arise that even the best minds will now be unable to foresee.

That such contingencies and complications will be likely to array themselves on the unfavorable side rather than on the favorable, cannot be denied. Still, it is by no means impossible that more favorable conditions will, in some cases, be found than have been anticipated, and the execution of the work correspondingly facilitated.

Advantages.

1. Shortness of artificial channel required.
2. Good harbors. That on the Atlantic side is all that could be desired, while, on the Pacific, there is deep water, with good holding-ground, and the region is seldom visited by violent storms.
3. The cutting mainly in rock or stiff, tenacious clays. In such materials the amount of excavation required can be reduced to a minimum. The clay will form stable embankments, and its impervious character will greatly reduce losses from filtration and leakage.
4. Proximity of the heaviest work to the Pacific coast, rendering transportation of labor, "plant," and supplies comparatively inexpensive.
5. The greater part of the work to be performed lies within a healthy region, for the tropics.
6. Abundance of good timber for construction.
7. Absence of high winds along the canal-line. Transit would be greatly impeded in any canal lying through a region subject to violent winds.
8. Freedom from liability to terrestrial convulsions of a nature likely to affect the permanency of the canal-works.
9. Absence of large streams, or of deep valleys to be crossed at a high elevation.
10. Friendly attitude of inhabitants and disposition of government to grant favorable terms.

11. Fertility of the soil. Under proper management the country in the vicinity of the line could be made to produce the greater part of the supplies required by the laborers.

Disadvantages.

1. The necessity of resorting to a tunnel. This, while it is no doubt practicable, involves uncertainty in estimates of cost, great expense in construction, and a probable increase in the difficulties attending transit especially for large ships.
2. The steep descent of the Pacific slope, requiring the grouping of a large number of locks, and consequently increasing the liability to accident to the works.
3. Very heavy cuttings required in the valleys of the Doguado and Chiri-Chiri.
4. Limited water-supply during dry seasons.
5. Liability to damage to works from sudden floods. It is believed that this contingency is well provided against in the accompanying plans, yet the liability to sudden and violent floods in a hilly country subject to excessive rains cannot be overlooked.
6. Excessive rains, likely to wash away embankments while in course of construction and to interfere generally with the progress of the work.
7. Shortness and uncertainty of the periods yearly well suited to carrying on the work of construction.
8. Undeveloped state of the country and scarcity of native labor.
9. Remoteness from the great commercial centers of the world.

In concluding this report I have to state my belief that, with all the imperfections with which our survey is justly chargeable, it affords, in connection with the previous surveys of Commander Selfridge, all the data necessary to a reasonably close approximation to the merits of the Napipi route.

The progress of the survey developed an amount of work greatly in excess of what had been anticipated. To have made the survey in a manner entirely satisfactory to myself would have required at least three times the force at my disposal. I felt especially the need of more officers. And I would suggest this as a point worthy of the consideration of future explorers. An intelligent and efficient officer, ready to turn his hand to anything, can often accomplish a vast amount of valuable work without other assistance than can be afforded by the natives of the country, while a large number of men without the intelligence to properly direct their labors are worse than useless.

It is easy to see, then, that to accomplish our task, even in an imperfect manner, the heartiest co-operation and the greatest personal exertion were required on the part of every member of the expedition, officers and men.

That this hearty co-operation existed and that these personal exertions were put forth, it cannot be necessary to state. In my associates in his work I was certainly most fortunate, and to one and all my heartiest thanks are due.

Lieutenants Eaton, Sullivan, and Paine are already so well known in connection with works of this character that I am sensible of the fact that no words of mine can add to their reputation. Yet it is my pleasant duty to testify to the ability and indomitable energy that they severally displayed in the performance of the severe labors of the past season.

To Lieutenant Eaton fell the unenviable task of carrying the survey through the pestilential morasses near the Atrato. The sufferings of his little party while engaged in that work may be inferred from the fact that not one escaped a severe attack of fever as the result of the hardships and exposure to which they were subjected. It was only by the most stubborn perseverance and untiring labor, directed with most excellent judgment, that an unbroken line of levels over this section was obtained.

Lieutenant Sullivan's services in making reconnaissances to develop the topography of the country, alone, to say nothing of his other multifarious duties, were invaluable. Severe labor was required of the party under his command, which carried the survey up the rugged valley of the Doguado and over the divide, where transportation by water was, of course, out of the question, to the Pacific. He also relieved me of much extra care by assuming entire charge of our provisions and stores and by attending to the hiring and paying of the native laborers. In this latter, a trying task, he exhibited great tact and endless patience. We all owe him thanks for the thoughtful attention to which much of our comfort in camp was due.

Lieutenant Paine, in addition to his severe daily labors in the field, took general charge of the meteorological observations and of the experiments for ascertaining the flow of the Napipi. These duties required from half an hour's to an hour's extra labor each day—no slight matter when one's regular duties are of the most laborious and exacting character; but they were always cheerfully and carefully performed. His arrangements for determining slight changes in the level of the Napipi were ingenious, and his results may be relied upon as accurate. The rapid progress of our survey was also due, in a great measure, to the skill with which he handled the gradienter.

Ensign Barroll took hold of the work, which was entirely new to him, with such ability and zeal as to compensate in a very short time for lack of previous experience. He was always ready for hard work, and when the party engaged in the survey of the line for the aqueduct became so crippled by the sickness of its members that further progress seemed impossible, he volunteered to carry the rod, and did double duty as rodman and recorder for the rest of the survey. His services throughout were of the greatest value.

To Assistant Surgeon Norfleet, also, the work of the expedition was a new experience, He was always attentive to the sick, and assisted constantly and effectively in the work of the survey, outside of his own particular department.

To the care of Commander Selfridge, who was good enough to attend to the preparation of the provisions for the expedition, we were indebted for an ample and palatable ration. I am also under great obligations to Commander Selfridge for valuable suggestions in regard to the prosecution of the survey and the preparation of its results.

To Captain Barrett and the officers of the Canandaigua we all owe hearty thanks for courteous consideration and many kindnesses, as well as an evident desire to forward in every way the interests of the expedition.

I have elsewhere expressed my appreciation of the kindness of Mr. Menocal in affording me assistance in the preparation of the data acquired by the expedition, at the expense of frequent drafts on his otherwise fully occupied time.

To W. H. Hutton, civil engineer, and Alfred Duvall, civil engineer, of Baltimore, and S. T. Abert, United States civil engineer, at Washing-

ton, I am likewise under many obligations for their kindness in replying promptly and fully to my request for an expression of their opinion on engineering questions.

Finally, I may say that, on the part of every one with whom I have been brought officially in contact, while engaged in this work, I have received such ready and effective assistance that, with the most ordinary care on my part, success was assured.

Trusting that the objects for which the expedition was sent out have been as well fulfilled as circumstances would allow, and thanking the Department for the confidence with which it has honored me,

I am, sir, very respectfully, your obedient servant,

FREDERICK COLLINS,
Lieutenant.

Hon. GEORGE M. ROBESON,
Secretary of the Navy.

No. 14.

MISCELLANEOUS.

VISIT OF THE EUROPEAN FLEET TO PORTS OF NORTHERN EUROPE.

No. 23.] UNITED STATES STEAMSHIP FRANKLIN,
FLAG-SHIP ON THE EUROPEAN STATION,
At Sea, Gulf of Finland, July 12, 1875.

SIR: I beg leave to make the following report of the official courtesies shown to me and to the officers of my command during my recent visits to Hamburg, Berlin, and Kiel, Germany.

As I have before advised the Department, the Franklin and Alaska arrived in the river Elbe, and anchored near Glückstadt on the 8th of June. The usual salutes were fired off Coxhaven, at the mouth of the river, where a dispatch-steamer of the Imperial navy awaited our arrival, and accompanied the ships up to the anchorage. The commanding officer of this steamer then came on board the flagship with polite messages of welcome from the admiral commanding at Wilhelmshaven, and with offers of services.

On the 10th of June I made a temporary transfer of my flag to the Alaska, and with that ship proceeded up the river to Hamburg. On the 11th, accompanied by Mr. Robinson, United States consul, I called upon the syndic and burgomaster of the city of Hamburg; and in the afternoon of the 12th went to Berlin, accompanied by the officers of my staff and a number of others from the ships. We were received at the railway-station at Berlin by Mr. Fish, secretary of the United States legation, and by Commander Eisendecker, of the Imperial Germany navy.

In the forenoon of the 13th I visited the Hon. J. C. Bancroft Davis, United States minister at Berlin, at the legation, and with him called upon the minister of foreign affairs; and afterward, accompanied by the minister and my staff, I called upon Prince Von Bismarck, Lieutenant-General Von Stosch, minister of state and chief of the imperial admiralty, and upon the other ministers of state, and the president of the Bundersrath.

In the evening I and the several officers with me were entertained

r by the Hon. Mr. Davis, our minister, and met the principal
s of the government then in town.
e 15th a dinner was given by Lieutenant-General Von Stosch,
the imperial admiralty, at which I met many distinguished

timation having been given our minister that the crown prince
ıcess would, in the absence of the Emperor, be pleased to see
ıeir palace at Potsdam, Mr. Davis requested for me the honor
sentation to them. In reply, the 16th was designated as the
which the prince and princess would receive me, and a most
s invitation was added, to myself and the officers accompany-
to dine with their royal highnesses after the presentation. On
, therefore, at noon, I, with my staff, our minister, Mr. Davis,
ınt-General Von Stosch, and a number of other imperial officers,
d by railway to Potsdam, where carriages from the palace were
he station to meet us.
after reaching the new palace we were received by the prince
cess, and the interview was marked by a cordiality of manner
art of their royal highnesses which was exceedingly pleasing to
e naval representative of our Government on this station. At
ıer which followed the presentation, about eighty guests were
ıed.
dinner, the crown prince placed carriages at our disposal for a
rough the parks and gardens of the palaces about Potsdam,
were finally taken to the station in season to return to Berlin
ening train.
g the whole time of my stay in Berlin I was the recipient of the
il attentions from the German officers, and was met everywhere
ressions of good feeling toward the service and the country to
belong.
es me pleasure to remark, also, in connection with my visit to
, that I feel myself indebted to the Hon. Mr. Davis, our minis-
ermany, for many courtesies shown by him to me, and that I
his forethought and attention the very agreeable conditions
ndered so satisfactory my intercourse with the officials of the
government.
e 18th I went to Hamburg, and on the following day proceeded,
l the Alaska, down the river to the anchorage at Glückstadt,
y flag was re-transferred from the Alaska to the Franklin. The
of the Alaska remaining meantime at Hamburg, enjoyed many
es from the residents of that place.
e 20th of June the Franklin and Alaska sailed for Kiel, at which
located one of the large German naval stations.
ng at Kiel on the 24th of June, there was found in that port the
iron-clad squadron for instruction, consisting of the flag-ship
k William, Crown Prince, Kaiser, and Hansa, about to depart
nmer cruise. The admiral commanding, Rear-Admiral Henk,
yed the sailing of his squadron to await the arrival of my ship,
ained in port for the four days following.
my officers received, at Kiel, most hospitable attention from
lmiral Merner, commanding the naval station, and from Rear-
Henk, commanding the iron-clad squadron.
e evening of the 25th a brilliant ball was given to the officers of
s by the admirals and officers of the station and the squadron in

urn, I had the honor to entertain the German admirals and com-

manding officers and Mr. Davis, our minister at Berlin, who had c to Kiel to visit us; and on the 28th a matinee was given on board flag-ship, to which were invited all the officers of the navy, the ar and of the civil service, stationed at Kiel, together with the ladies of t families. My ships were coaled from the imperial dock-yard as bef reported, and repeated and earnest offers made of any supplies or s ices which might be in the power of the officers of the station to ren us.

On the 1st of July I left Kiel for Stockholm, Sweden, and, afterwa Cronstadt, Russia; and I shall have the honor to address to the Depa ment further advices of my visits to those places.

I am, sir, very respectfully, your obedient servant,

JOHN L. WORDEN,
Rear-Admiral, Commanding U. S. Naval Forces on the European Station.

Hon. GEO. M. ROBESON,
Secretary of the Navy, Washington, D. C.

No. 25.] UNITED STATES STEAMER FRANKLIN,
FLAG-SHIP ON THE EUROPEAN STATION,
In the Baltic between Cronstadt and Copenhagen, July 25, 1875.

SIR: Reverting to my dispatch No. 23, of July 12, and continuing the account of my visits to the ports in the northern part of this station, I have the honor to advise the Department that after a pleasant passage from Kiel, Germany, which place the flag-ship and Alaska left on the 1st of July, I arrived at the anchorage near Waxholm, about twelve miles below Stockholm, on the afternoon of the 5th. The Fourth of July being Sunday the usual salutes were fired at sea at noon on the 5th, and the customary salutes to the Swedish flag were fired upon anchoring. Soon after the ships anchored off Waxholm, a steam-yacht of the Swedish navy came down from Stockholm bringing the United States minister-resident at that place, Mr. Andrews, and Captain Van Horn, who came with messages of welcome and offers of service from Admiral Lagarcrantz, commanding the naval station at Stockholm, who also kindly assigned to duty, as my aid during my stay in Stockholm, Lieutenant Hjalhammer of the Swedish navy. The minister, Mr. Andrews, informed me that he had already made arrangements for my presentation to the King, who, being about to leave Stockholm, had appointed 12 o'clock of the next day, the 6th, for my reception. I therefore availed myself of the courteous offer of the steam-yacht sent down to me by Admiral Lagarcrantz, and early in the forenoon of the following day proceeded in her to Stockholm. At noon I, with my staff and several other officers, was presented by our minister to the King, Oscar II, at the palace, and had a very agreeable interview with His Majesty. After the presentation I called on Baron Von Otter, minister of marine, on Baron Ugglas, civil governor of Stockholm, on Count Dehaudels, military governor, and on Rear-Admiral Lagarcrantz, commanding the naval station. In the afternoon of the same day the King embarked on board the frigate Venadis, and, attended by two other ships of war, sailed for Russia to visit the Emperor. As the Swedish squadron passed Waxholm, our ships at anchor off that place manned their yards and fired salutes, which courtesies were returned from the King's flag-ship. I remained in Stockholm until the 9th of July, and during my stay there much hospitable attention was extended to me and to the officers with

ie. An excursion, to which all were invited by the minister of marine, as made by water to the castles at Gripsholm and Drottingholm, and nongst the guests invited were the United States and British min-ters, the minister of war, Commodore Peyrow, and many other distin-iished Swedish officers and a number of ladies. On the morning the 9th returned to the flag-ship off Waxholm, and the same day ceived on board the United States and British ministers to Sweden, ie minister of marine, Admiral Lagarcrantz, and several other officers. 1 the evening of the 9th a very handsome ball was given by the urgomaster and residents of Waxholm to the officers of the ships, nd as many as could go attended it. Every day of the stay of the hips in this port, hundreds of persons visited them. On the 11th of uly, after a day's delay on account of bad weather, I left the anchor-ge of Waxholm and sailed for Cronstadt, Russia, where I arrived after a pleasant passage on the 13th. Upon entering the harbor of Cronstadt the flag-ship was boarded by an officer, sent by the com-mander-in-chief of the Russian fleet then in port, who informed me that a grand review of the fleet was to be made on the 17th, by the King of Sweden and the Emperor of Russia, and that places had been reserved for the ships under my command. This officer indicated the anchorage which we were invited to take, and I found on reaching it that we had been assigned positions of honor in the line next to the flag-ship of the Grand Duke Constantine, Lord High Admiral; the two Swedish frigates being anchored in similar positions on the other side of the flag-ship. After the usual salutes had been given and returned, the Grand Duke Constantine not being on board his flag-ship, I visited the Russian Vice-Admirals, commanding afloat and on shore, and the Swedish Vice-Admiral. These visits were returned the same day, and many calls made upon me by other commanding officers. The Russian Vice-Admiral was very civil in placing at my disposal a steam-yacht to take me to St. Petersburg when I might wish to go there. On the 14th His Imperial Highness the Grand Duke Constantine came down to the anchorage and went on board the Rurick. Upon the hoisting of his flag, it was saluted by all the ships in the harbor with twenty-one guns. After this I called on His Imperial Highness, who returned my visit the same afternoon and upon his departure the yards of the Franklin and Alaska were manned and a salute fired. The same evening, I, with my commanding officers, dined with the Grand Duke on board his flag-ship. On the 15th I embarked on board the steam-yacht, placed at my service by Vice-Admiral Cosakewitch, governor of Cronstadt, and went up to St. Petersburg. I called there upon Mr. Schuyler, United States chargé d'affaires, in the absence of the minister, and paid visits also to Baron Jomini, acting minister of foreign affairs, Vice-Admiral Lessooski, minister of marine, and several other Russian officials, and to Prince Henry VII of Reuss, the German embassador. In the evening of the same day an invitation was received asking me and the officers of my ships to attend the review of the troops to be held at Krusuoc-Selo on the following day, in honor of the King of Sweden, who was the Emperor's guest at his palace at Peterhoff. I was myself unable to accept the invitation, but a number of officers availed themselves of it and wit-nessed from the royal stand, where places were given them, a mag-nificent spectacle in the review and exercises of sixty thousand troops of all arms in the Russian army, led by the Emperor in person and reviewed by the King of Sweden. The review was followed by a col-lation served in a pavilion on the field, and our officers were most hos-pitably entertained. I returned to my flag-ship at Cronstadt on the evening of the 16th to prepare for the naval review which was appointed

for the next day. The fleet assembled in the roads of Cronstadt consisted of forty-one ships of the Russian navy, three of the Swedish navy, the two under my command, and the English royal yacht Osborne, forty-seven vessels in all, which were anchored in three lines abreast, the Ruric, flag-ship of the Grand Duke Constantine, Lord High Admiral, being in the middle of the center line. The two Swedish frigates and the Franklin and Alaska had positions in the same line with the Rurick, and next to her on either side. Enclosed herewith is a tracing showing the positions and names of all the ships, with the names, also, of their commanding officers. Of the Russian ships, seven were single-turret monitors, similar to the Passaic class of our Navy; five were large double Cole's-turret monitors; two others were heavy iron-plated casemate ships, full-rigged; two were iron-plated batteries; and another was the new turret-ship, Peter the Great, said to be the strongest ship afloat. The other Russian vessels were chiefly steam corvettes and gunboats. The whole triple line was about three miles long. Wishing to conform to the motions of the Russian commander-in-chief, I was furnished with a memorandum of the ceremonies to be observed in the review and the visits of the royal party to the ships, and an officer was sent by the Russian admiral on board the Franklin to read and report signals during the day, and to give information where required. The day, Saturday the 17th of July, was fine, with a clear sky and light breeze, and at about 12 o'clock the imperial yacht, attended by two others, was seen approaching from the the direction of Peterhoff, about ten miles distant from the anchorage, where the Emperor has his summer palace. The yachts came down between the first and second lines of the fleets, and, as they approached, all the ships fired salutes and manned yards, the crews all in white, while the monitors had their men paraded in ranks on deck. The Emperor and the King of Sweden stood on the upper deck of their yacht, and, as they passed down the lines, six cheers were given from each ship, no salutes being fired at this time, as the yacht bore only the Emperor's narrow pennant. After passing down between the lines on one side and returning upon the other, the yards being kept manned, and the cheers being repeated on their return, the yachts anchored near the Grand Duke's flag-ship. Immediately upon their anchoring, the royal standard of Sweden was displayed at the masthead of the imperial yatch, and it was at once, upon the signal of the first gun from the Russian flag-ship, saluted by all the vessels of the fleet, and all the forts and batteries in and around the harbor, simultaneously. Their majesties and suites then went on board the Swedish flag-ship Vanadis, where the imperial Russian standard was displayed and saluted by all the ships, with their yards manned, and by the forts. From the Vanadis the royal party came on board the Franklin, where they were received with all the honors. Upon the approach of the royal barges the yards were manned; and, when their majesties came on board the Franklin, the imperial Russian standard was displayed at the main, and saluted by all the other ships and by the forts: but, by the expressed wish of the Emperor, no salute was fired by the Franklin until his departure. The royal party inspected the decks and visited the cabin of the ship, remaining on board about half an hour, and upon their departure the yards were again manned and a salute fired. Leaving the Franklin, their majesties proceeded to the Rurick, the flag-ship of the Grand Duke Constantine, Lord High Admiral of the Russian navy, and the same ceremonies as in the other visits were gone through, when they went on board and left that ship. Among others accompanying the Emperor and King in the visits were the Czarowitch Alexander, and the Czarena Marie Elizabeth, Princess

Daguear of Denmark, with several ladies in attendance; the Grand Duke Constantine, Lord High Admiral; the Grand Duke Nicholas, Commander-in-chief of the Imperial Guards; His Royal Highness the Duke of Edinburgh; the Grand Duke of Mecklinburg; the German Embassador and Swedish Envoy Extraordinary; Generals Greigh and Potahoff, Admiral Glazenap, Vice-Admiral Poisett, Lessoosky and Pofoff; and many other distinguished officers, both Russian and Swedish. From the Grand Duke's flag-ship the royal visitors returned to the yachts, which immediately got under way and proceeded, amid the cheers and salutes from all the ships, up the bay to Peterhoff. I had afterward the honor to receive, through the Grand Duke Constantine, an expression of the Emperor's thanks for the part taken by my ships, as co-operating to the brilliant success of the review and of the reception of the King and Emperor, by the fleet. In the evening of the next day, July 18, I went with Captains Franklin and Carter, by invitation of the emperor, to Peterhoff to witness the *fête* and illumination which were to be given in the parks and gardens of the palace in honor of the King of Sweden, the guest of the Emperor. We were conveyed from the Roads of Cronstadt in a steam yacht, courteously sent to us by the Russian admiral, to Peterhoff, where carriages awaited us at the landing. We were driven to the palace, and an officer of the household assigned to conduct us to the pavilion, where the guests were assembled to witness the festival. Here we were received by the Emperor and the King of Sweden, and the members of the royal family, and were spectators of performances acted in a beautifully-decorated theater, erected, as was the royal pavilion also, on an island in the lake. After this, the royal party and guests passed to another island, where they were entertained with the songs and dances of bands of gipsies and other people, in the strange costumes of their tribes, from distant parts of the empire. The grounds of Peterhoff, with their fountains and falls of water, which are among the finest in Europe, the islands in the lake, together with the palaces and other buildings, were superbly illuminated with myriads of lamps, and the whole scene was one of wonderful brilliancy, such as is scarcely to be witnessed except in Russia. The *fête* ended at about midnight, when, although the Emperor's hospitality extended to the reservation for us of appartments in the palace, we returned to the ships at the anchorage off Cronstadt. On Monday evening the King of Sweden came down to his flagship, accompanied by the Emperor, and after a visit to the Russian iron-clad, Peter the Great, left the harbor with his squadron, accompanied by two Russian frigates, at about 8 o'clock, for Stockholm. The vessels at anchor manned yards and fired salutes, and the Russian ships were illuminated, one after another, all down the line as the Swedish squadron passed out to sea. That night and the next morning many of the Russian iron-clads went out of the harbor for practice cruises in the Baltic. On the following day, July 20, after paying farewell visits to the Russian admirals, I took my departure at noon with the Franklin and Alaska. As we left the harbor my flag was saluted from the battery on shore and the ships in the harbor, and the latter also cheered us as we passed, all of which was duly responded to, and we proceeded on our way to Copenhagen, Denmark. Concerning my visit to that city, I shall have the honor to advise the Department hereafter.

I have the honor to be, sir, very respectfully,

your obedient servant,

JNO. L. WORDEN,

Rear Admiral Commanding U. S. Naval Force European Station.

Hon. GEORGE M. ROBESON,

Secretary of the Navy, Washington, D. C.

No. 30.]

UNITED STATES STEAMSHIP FRANKLIN,
FLAG-SHIP ON THE EUROPEAN STATION,
Southampton, August 30, 1875.

SIR: Referring to my dispatch No. 25 of the 25th of July, which closed with my departure from Cronstadt with the Franklin and Alaska, I have now the honor to advise the Department that after a pleasant passage of five days I arrived at Copenhagen on the 25th of July.

The Juniata and Alaska were found at anchor in the port, the Alaska having been directed, on leaving Cronstadt, to proceed direct to Copenhagen by the shorter course, which the flag-ship could not take.

On the 26th, accompanied by my staff, I visited the United States minister, Mr. Cramer, at the legation, and also called upon the Danish minister of war and marine, the minister of foreign affairs, the chief officials of court, Admiral Somers, chief of the Danish navy, the commodore commanding the naval station, and the burgomaster of the city. These visits were duly returned to me on board ship.

Our minister, Mr. Cramer, having arranged for my presentation to the King of Denmark, Christian IX, on the 30th, I proceeded in the afternoon of that day, accompanied by the minister, my commanding officers and staff, to Fredenborg, where the court then was at the summer palace.

We were presented to the King at half past 4, and had the pleasure of being received with a most agreeable cordiality. After the presentation we had the honor of dining with His Majesty and the royal family, together with the members of the cabinet and the officers of the royal household, and we returned to Copenhagen in the evening, having passed a very satisfactory and pleasant day.

The King signified his desire to visit my flag-ship, and appointed 1 o'clock of the next day, the 31st, for the purpose. Accordingly at that time I had the honor of receiving His Majesty, attended by the Crown Prince, Prince John, his brothers, and several officers of his suite, on board the Franklin.

The Alaska and Juniata, which were at anchor in the inner harbor, manned yards as the royal barge passed them, and the Alaska saluted the Standard with twenty-one guns. His Majesty was received with all the honors on board the Franklin, the yards being manned and salutes fired when he came on board and when he departed.

The Alaska sailed for Southampton that afternoon. In the evening of the same day Mr. Cramer, our minister, entertained me and a number of officers from the ships at dinner at the legation.

On the first day of August the Franklin, with the Juniata in company, left Copenhagen for Flushing.

Passing Elsinore, where the Crown Prince resides, a salute of twenty-one guns was fired, with the Danish flag at the fore, as is customary when ships of war pass that place, and the salute was returned from the fort on shore.

It was my intention to visit Flushing and Antwerp, Holland, before proceeding to the English coast, but when the ships arrived off the former place on the morning of the 5th instant the weather was so bad that it was not deemed prudent to go in without a local pilot, which could not be obtained.

I therefore proceeded to "the Downs," off Deal, and anchored there in the afternoon of the same day, the 5th instant, the Juniata also anchoring at the same place in the evening. I here left the ship and

ent to London. On the 8th the Franklin and Juniata proceeded to outhampton Water and took an anchorage off the Royal Victoria Hos-ital, at Netley, where the Alaska already was.

It having been found necessary to repair the rudder of the Franklin, hich a board of survey had pronounced to be in an unsafe condition, s mentioned in my dispatch No. 26, of the 18th instant, it was unship-ed on the 12th instant and taken to a dock-yard to have a new stock itted. This was completed and the rudder reshipped on the 28th. Having returned from London on the 16th inst., I received an invitation or myself and the officers of the squadron to a banquet to be given by he president and members of the Chamber of Commerce of Southamp-on on the 20th, and another invitation to a banquet to be given by the nayor and council of Southampton, on the 24th.

These invitations were accepted, and with the commanding and a number of other officers from the three ships in port, I was entertained n a very handsome manner on each occasion. At the first banquet, given by the president and members of the chamber of commerce, about eighty guests were present, and at that of the mayor and council the guests numbered one hundred and fifty, amongst them being a number of members of Parliament, officers of the army and navy, and the mayors of several of the neighboring towns.

At both of them many toasts were given and speeches made express-ing a very cordial and kindly feeling of friendship for America and Americans, and a warm desire to preserve and increase the amicable diplomatic and commercial relations which now exist between England and the United States.

On the 26th of August a dinner was given by the surgeon-general and the officers of the army medical staff, at the Royal Victoria Hospital at Netley, which I, with several officers from the ships, had the pleasure of attending.

On the 27th instant a reception was given on board the flag-ship by myself and the officers of the squadron to the mayor and council, the president and members of the chamber of commerce, and the many gentlemen, and the ladies of their families, of Southampton and vicinity, who had shown us attention.

The following day, the 28th instant, the Alaska and Juniata sailed; he former with orders to visit Havre, France, and thence proceed to Lisbon; the latter with orders to proceed to Lisbon, where both ships re to await the arrival of the flag ship. To-day, the 30th of August, it s my intention to leave this port for Lisbon. The Congress, as I have dvised the Department, in another dispatch, was at Malta on the 27th f August, and was about to proceed up the Adriatic, in pursuance of rders given her before her visit to Tripoli, and she is to be at Ville-ranche by the 25th September.

The affair of the insult given by Ottoman sailors to the United States onsul at Tripoli, for the investigation of which the Congress and Hart-ord were diverted from their intended courses, having been, as Captain English reports by telegram, "amply atoned for and satisfactorily set-led," I shall have the honor of transmitting to the Department, at the arliest possible day, a report of the incidents of the cruise of the Con-gress, during the summer months, along the southern shores of the Mediterranean and up the Adriatic, as well as her visit to Tripoli.

I have no present intelligence of the Hartford, beyond the fact of her rrival at Tripoli on the 21st instant, but look for further advices on my rrival at Lisbon, and I shall then make such dispositions of the ships

s may be found most expedient, with the view of transferring to h
uch persons as are to be sent home.

Very respectfully, your obedient servant,

JOHN L. WORDEN,
Rear-Admiral, Comdg. U. S. Naval Forces on European Station.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

VISIT OF THE KING OF THE HAWAIIAN ISLANDS TO THE UNITED STATE
—THE NORTH PACIFIC FLEET AT THE HAWAIIAN ISLANDS.

No. 2.] UNITED STATES SHIP BENICIA, (2d rate,)
OFF NAVY-YARD, MARE ISLAND, CAL.,
January 12, 1875.

SIR: I have the honor to transmit herewith copy of a letter (marked A) written to Her Majesty the Queen of the Hawaiian Islands, at the express request of His Majesty; also, (marked B,) a copy of His Majesty's letter to me, and copy (marked C) of my reply.

I also inclose my letter to His Majesty, and respectfully request that it be forwarded to his address.

Very respectfully, your obedient servant,

WM. E. HOPKINS,
Captain Commanding.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

UNITED STATES SHIP BENICIA, (2d rate,)
SAN FRANCISCO, CAL., *December* 12, 1874.

SIR: It is with a feeling of profound respect that I have the hon
to acknowledge the receipt of Your Majesty's letter under date of D
cember 5, which reached me some days after Your Majesty's departu
from San Francisco for Washington and the East.

I trust it is unnecessary for me to say how deeply myself, and all t
officers of the ship feel Your Majesty's kind acknowledgment of t
courtesies which it was both our greatest pleasure and duty to ext
as far as lay in our power.

As regards Your Majesty's kind offer to enroll my name on the li
the Order of Kamehameha 1st, the order of honor and integrit
Your Majesty's kingdom, I can only say that it will afford me the
profound gratification to accept the high honor Your Majesty
been pleased to extend to me, and Your Majesty's further kindn
offering to obtain, through Your Majesty's minister at Washingt
consent of the Congress of the United States to my acceptin
Majesty's gracious offer, and I cannot doubt that it will afford
satisfaction to the officers of the ship, that to me as their chie
Majesty has been pleased to thus show Your Majesty's approva
manner in which the duties of the ship were performed during t
period of Your Majesty's stay on board.

I beg leave to assure Your Majesty that during my whole lif
l be a matter of profound gratification to me to recall the s
which Your Majesty was pleased to extend to me Your

courtesy and kindness, and that I may yet hope, at some future day, to again visit Your Majesty's domains.

Trusting that Your Majesty will enjoy your visit, and wishing Your Majesty a safe and fortunate passage back to your domains, and with the assurance of my sincere thanks for Your Majesty's kind consideration, I have the honor to remain, Your Majesty's most humble and faithful servant,

W. E. HOPKINS,
Captain U. S. N., Commanding United States Ship Benicia.

His Majesty THE KING OF THE HAWAIIAN ISLANDS.

SAN FRANCISCO, *December* 5, 1874.

DEAR SIR: Please accept my sincere thanks for your attention to myself and suite during the voyage from the islands to this port; and will you be kind enough to thank, in my name, all the officers under your command for the many acts of politeness and kindness of each of them?

I need not say that the voyage will be remembered by me with the greatest pleasure during my whole life; and I am desirous, captain, of giving to you some token which will agreeably keep it fresh in your mind. I know of nothing within my power which I so much value as the decoration of the Order of Kamehameha 1st.

I am aware that by the law of the United States no officer in their service may receive any mark of the kind without the express permission of Congress; but if it will be agreeable to you to accept and wear my decoration, I shall charge myself with the agreeable duty of directing my minister at Washington to ask, in your behalf, the requisite permission, and will then cause the insignia to be immediately transmitted to you from Honolulu.

Permit me, captain, to express a hope that I shall see you again in my own country, and accept my best wishes for your future happiness and prosperity.

KALAKAUA, R.

Capt. WILLIAM E. HOPKINS,
United States Steamer Benicia.

UNITED STATES SHIP BENICIA, (2d Rate,)
Off San Francisco, Cal., December 2, 1874.

MADAM AND YOUR MAJESTY: His Majesty the King, having most graciously conveyed to me your Majesty's request "that I would write to inform your Majesty of his safe arrival at San Francisco," I have only to avail myself of the high privilege your Majesty has conferred on me.

As your Majesty is aware, we sailed from Honolulu the 17th of November, and after a pleasant passage, during which His Majesty seemed to enjoy himself, and was certainly in good health, we, through the providence of a good God, arrived safely here after a period of eleven days and a few hours passed at sea.

The next day His Majesty landed, and has been most cordially received by all the authorities, civil, naval, and military, and, I trust, has enjoyed himself.

On Saturday, the 5th, His Majesty will take his departure for Wash-

ington, where, I am sure, His Majesty will receive a most cordial a respectful recognition, such as befits His Majesty's state and his h character, personal and official.

Having concluded the pleasant duty your Majesty was so pleased confer on me, I have only to add,

I remain, as ever, your Majesty's most respectful and obedient serva

WM. E. HOPKINS,

Captain Commanding United States Ship Benicia

No. 14.] NORTH PACIFIC STATION,

UNITED STATES FLAG-SHIP PENSACOLA, (2d Rate,)

Honolulu, Hawaiian Islands, February 16, 1875.

SIR: I hereby respectfully report the arrival of this ship at this port on the 15th instant, after a passage of twelve and a half days from San Francisco, and having on board as passengers His Majesty the King of the Hawaiian Islands and suite.

The passage was a rough one, and we had but little assistance from the northeast trade-winds, which we had good reason to expect. In consequence of a heavy swell, the ship rolled very much during several days of the passage. On the fourth day out the ship, under sail alone—single-reefed topsails—the fires being banked, she rolled away the main topmast, bringing down a large mass of wreck with it, which it took eight hours to clear away, so heavily did the vessel roll. Fortunately no one was injured. His Majesty stood the passage very well, indeed, and continued in good health all the way. I used all efforts to carry out the instructions contained in your communication of January 2, "to receive him on board with all the honors due to his high position, and provide for his comfort and the comfort of his suite on the passage to Honolulu."

On the 12th instant, it being the first anniversary of the election of His Majesty to reign over the kingdom and people of Hawaii, although at sea, the flags were hoisted and carried through the day, the Hawaiian royal standard at the main.

At 1 p. m. all the officers of the ship in a body and in appropriate uniform called to pay their respects to the King, and offer their congratulations, which he seemed to appreciate highly. Upon proposing the health of and a prosperous reign to His Majesty, a royal salute of guns was fired.

Upon the King's disembarking from the Pensacola all the usual salutes and demonstrations to royalty were bestowed upon him by the ships in port. Upon landing at the wharf he was received with salutes, huzzas, and with enthusiasm by his people. Trusting everything in connection with the King has been carried out to the satisfaction of the Department,

I remain, very respectfully, your obedient servant,

JOHN J. ALMY,

Rear-Admiral U. S. Navy, Commanding U. S. Naval Force, North Pacific Sta

Hon. GEORGE M. ROBESON,

Secretary of the Navy, Washington, D. C.

No. 16.] NORTH PACIFIC STATION,
UNITED STATES FLAG-SHIP PENSACOLA, (2d Rate,)
Honolulu, Hawaiian Islands, February 25, 1875.

SIR: Herewith I transmit copies of correspondence between his excellency W. L. Green, His Hawaiian Majesty's minister of foreign affairs, and myself.

I am, very respectfully, your obedient servant,

JOHN J. ALMY,
Rear-Admiral U. S. Navy, Commanding
U. S. Naval Force, North Pacific Station.

Hon. GEORGE M. ROBESON.
Secretary of the Navy, Washington, D. C.

DEPARTMENT OF FOREIGN AFFAIRS,
Honolulu, February 15, 1875.

SIR: At the request of His Majesty the King, I have now the honor to address you with the object of returning His Majesty's sincere thanks and acknowledgments for the uniform kindness and courtesy extended to him and to his suite while on board the United States ship Pensacola, by yourself as well as by the officers of the ship, and by which the voyage from San Francisco was made so agreeable to him. His Majesty also desires me to thank you and your officers in an especial manner for the demonstration on board of the Pensacola on the 12th instant in honor of his election to the throne of Hawaii on the 12th of February, 1874, and which recalled to his mind at the same moment how much this kingdom was indebted on that occasion to the prompt action of the ships of war of the United States and other friendly powers, and how securely he was able a year afterward to be absent from his kingdom, and confide its peace in the hands of his people and government, under the young prince regent, his brother, William Pitt Leleiohoku.

I have the honor to remain with the highest respect and consideration, sir, your most obedient servant,

W. L. GREEN.

Rear-Admiral ALMY,
Commanding the United States Squadron of the North Pacific.

NORTH PACIFIC STATION,
UNITED STATES FLAG-SHIP PENSACOLA,
Honolulu, Hawaiian Islands, February 19, 1875.

SIR: I have had the honor of receiving your communication of the 15th instant, conveying the thanks of His Majesty the King for what he considers kindness and courtesy extended to him and his suite by myself, the captain, and officers of the United States ship Pensacola, while His Majesty was our honored guest on board of the ship in making the passage from San Francisco to Honolulu. It is very gratifying to myself and officers to be thus assured that His Majesty was made comfortable and contented, as far as circumstances would permit, during his passage on board of the Pensacola, for it was not only the duty but the pleasure of the officers to do all in their power for the royal guest com-

mitted to their care, and whose presence on board was felt to be an honor.

On the part of the United States and its officials, there has always been a warm and a strong feeling of friendship and sympathy in behalf of the Hawaiian Islands and their prosperity, and toward those who hold the reins of government. Believing that the election of His Majesty King Kalakaua was a judicious one for the people and for the prosperity of the Hawaiian Islands, we could not but feel an interest in celebrating, as we did, the first anniversary of that event, though far distant on the ocean, and of which your excellency has been pleased to make mention in your letter of the 15th instant.

Be pleased to convey to His Majesty the assurances of esteem and respect in which he is held by myself, the captain, and the officers of the United States ship Pensacola, with our best wishes for a long and prosperous reign.

I have the honor to be, with the highest respect, your obdt. servant,

JOHN J. ALMY,
Rear-Admiral U. S. Navy, Commanding
U. S. Naval Force on North Pacific Station.

Hon. W. L. GREEN,
His Hawaiian Majesty's Minister Foreign Affairs.

No. 20.] NORTH PACIFIC STATION,
UNITED STATES FLAG-SHIP PENSACOLA, (2d rate,)
Honolulu, Oahu, Hawaiian Islands, March 5, 1875.

SIR: The United States ships Pensacola, Portsmouth, and Tuscarora, belonging to this squadron under my command, have been lying at this port for a fortnight together, which has given the officers and crews of the three ships a good opportunity to drill and exercise together, of which due advantage has been taken with much benefit to the service, I consider.

From the crews of the three ships eight companies of infantry, comprising three hundred and fifty men, were formed, and, with the permission of the government officials at this place, the men were landed and were exercised very thoroughly in the howitzer and musket exercises. These exercises were witnessed apparently with much gratification by His Majesty the King, his cabinet, and many government officials. The men acquitted themselves so exceedingly well that I was induced to issue a general order, a copy of which I herewith transmit.

I am, sir, very respectfully, your obedient servant,

JOHN J. ALMY,
Rear-Admiral U. S. Navy,
Commanding U. S. Naval Force, North Pacific Station.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

[Special Order No. 1.]

NORTH PACIFIC STATION,
UNITED STATES FLAG-SHIP PENSACOLA, (2d rate,)
Honolulu, Hawaiian Islands, March 4, 1875.

It becomes the pleasant duty of the commander-in-chief to thank the commanding and other officers and men of the squadron battalion and light battery for the excellent and zealous manner in which they have

conducted themselves at their shore exercises at Honolulu on the 26th of February and the 3d of March.

Especially at the drill and exercises of the 3d of March the sailors maneuvered and marched with the precision of regular and well-trained troops, and in witnessing it the commander-in-chief felt proud in having such officers and men under his command.

The commander-in-chief also takes this opportunity of expressing his satisfaction in regard to the inspections of the United States ships Portsmouth and Tuscarora.

JOHN J. ALMY,
Rear-Admiral U. S. Navy,
Commanding U. S. Naval Force, North Pacific Station.

NORTH PACIFIC STATION,
UNITED STATES FLAG-SHIP PENSACOLA, (2d rate,)
Off Hilo, Hawaii, Hawaiian Islands, May 31, 1875.

SIR: In my communication to the Department of the 10th of May, No. 30, I stated that I was about leaving Honolulu with this ship for a cruise to the other islands of the group.

I proceeded direct to Lahaina, the former capital, situated on the island of Maui—noted some years ago as being a favorite resort for American whalers, and an excellent place for obtaining supplies.

During a stay of three months at Honolulu, the capital, myself and the officers of the Pensacola had been the recipients of numerous ovations and entertainments, in consequence of our having brought the King safely back to his home, and I imagined that after this lapse of time the display of this grateful feeling had reached an end; but not so.

At Lahaina a very enthusiastic public reception was given us, held at the Government House, and headed by his excellency the governor and the principal officials of the island. At this time a very handsome and original address was delivered by one of the native citizens, to which I made a reply. Inclosed herewith please find copies thereof.

Then followed a native feast called "Luau," to which about two hundred people sat down, and which was one of the handsomest entertainments of the kind I had ever attended. The first toast given, at the end of the feast, and by a native, a member of the Hawaiian legislature, was "The health of President Grant," which was received with great enthusiasm.

After a short visit at Lahaina, I proceeded to Hilo, in the island of Hawaii, where the same cordial, enthusiastic reception awaited us, but somewhat varied in form.

The natives particularly requested, in which I acquiesced, that they should land us in their large canoes, especially fitted up with platforms and canopies, highly decorated with wreaths of evergreens and flowers, as they were wont to do in the days of the old chiefs, and as they sometimes do at the present day when they particularly wish to honor their King during his visits to the place.

Accordingly, in these canoes, myself, the captains, and the officers were conveyed from the ship to the shore. Upon landing we were received by his excellency the governor, and other officials of the islands, and a large concourse of people, and then proceeded to the Government House. On our way we passed under arches decorated with flags, evergreens, and flowers, and bearing inscriptions, as "Kalakaua and Grant," "Hail Columbia," "Welcome, welcome to the admiral and officers of the United States ship Pensacola," &c., &c.

Of course, myself and the officers of this ship are regarded as the representative, as the organ of the United States Government, and also of the officials of its States and cities, of the American people, and the medium through which these people desire to express their warm gratitude for, and feelings of high appreciation of, the hospitable and courteous treatment bestowed upon their King during his recent visit to the United States.

His Majesty, also, is not content merely with *alluding* to his reception by the American people, as he often does, but frequently dwells upon it at length.

It must be gratifying to the Government, and to the people of the United States, to know of this evidence of gratitude, manifested in so many ways on the part of the officials and the people of the Hawaiian Islands for the hospitality and attention extended to their King and his suite while visiting the country.

I have the honor to be, sir, very respectfully, your obedient servant,

JNO. J. ALMY,
Rear-Admiral U. S. Navy,
Commanding U. S. Naval Force on North Pacific Station.

Hon. GEO. M. ROBESON,
Secretary of the Navy, Washington, D. C.

ADMIRAL: In the name of the people of the districts of Lahaina and Kaauapali, we now have the honor to express to you a heartfelt aloha, and it is with special pleasure and great delight that we tender you a cordial welcome to these shores of Maui, the island of Kaina, and the garden of the group. And on their behalf we beg most respectfully to tender you their sincere thanks for the opportunity afforded them on your arrival here with your flag-ship, the Pensacola, of testifying to you that Lahaina, the once famous retreat for American whalers, is ever awake to extend the soft hands of welcome and the warm and cordial grasp of friendship.

We are fully aware of the kind and most polite attention paid to His Majesty the King, and suite, (including his excellency, our respected governor,) while on board your flag-ship on their passage home from San Francisco.

We have read with a good deal of interest of the kind reception, the warm greeting, and the perfect ovation which His Majesty the King and suite received at the hands of your prosperous people and friendly Government; and in concert with the popular sympathy of Hawaii Nei, which they feel for the kindness and liberality of your people, permit us, Admiral, to convey our sincere thanks and the well-wishes for the prosperity of your Government. We are mutually sensible of the fact that the maintenance of good-will and amity among nations rests solely upon the peaceful and the harmonious interchange of friendly relations. We are awake again to the high sense of our duty, and convey our highest appreciation to your Government on the ratification of the reciprocity treaty by the honorable Senate, and we sincerely trust that the enactment of such a measure will redound to the wealth and prosperity of the two governments.

Admiral, Captain Gherardi, and officers of the Pensacola: Fervently hoping that the few hours you spend on Maui may be agreeable to you as it was on Oahu, we bid you aloha, and thrice aloha, to Lahaina and the tranquillity of Hauola.

Your Excellency Governor Kapena, gentlemen of the committee, and the good people of Lahaina:

On behalf of myself, the captain, and officers of the Pensacola, I thank you very kindly for the pleasant words of welcome which you have spoken, and for our friendly and hospitable reception here.

The Government of the United States, its officials, all its citizens, have always felt a warmi nterest, a strong feeling of friendship and sympathy for the Hawaiian Islands and their prosperity, and toward those who hold the reins of government.

The United States Navy, which now for fifty years has been visiting these islands, has always taken the greatest interest in the people.

The very first treaty made by the Hawaiian Islands with any foreign power was with the United States in the year 1826, executed and signed in Honolulu, on the part of the United States by Commodore Thomas ap Catesby Jones, of the United States Navy, and on the part of the Hawaiian Islands by Elizabeta Kuahumauu, (Queen Regent,) Kanaimaku, and others.

The spirit and terms of that treaty have been fully carried out to the present day.

I am sure that the inhabitants of these islands cannot complain of ever receiving any other than good treatment by the American people.

It gives me pleasure to speak of your worthy and excellent King Kalakaua. The members of the Government and the people of the United States received him most cordially upon his recent visit, as Governor Kapena, who was an eye-witness, can testify; and His Majesty made a most favorable impression upon them. We, officers of the Navy, took great pleasure in caring for His Majesty's comfort and contentment on board ship, and in bringing him safely back to his dominions, to his native land, to his home, and it would have made us unhappy if any accident had occurred to him. It gives me and the officers of the Pensacola, as it would those of the Benicia were they present, great pleasure to be assured that you were so well satisfied and made happy with the treatment which we bestowed upon the King. I most sincerely trust and hope that the good people of the Hawaiian Islands will always be prosperous and happy, and that all the members of this company here assembled will be favored with a long life and much happiness.

Again I thank you for the honor and pleasure this reception has given us.

LAHAINA, *May* 12, 1875.

LOSS OF THE SARANAC.

VICTORIA, VANCOUVER ISLAND, *June* 24, 1875.

SIR: It becomes my painful duty to report the loss of the United States steamer Saranac, (2d rate,) lately under my command. In my communication of the 16th instant, sent from Nanaimo, Vancouver Island, I stated my reasons for having stopped there, and for taking the inside passage to Sitka. In accordance with my intentions therein expressed, I got under way at 8.50 on the evening of the 17th instant, and stood up the Straits of Georgia, the ship being in charge of a pilot. At 7.20 a. m. of the 18th instant we entered Discovery Passage, and, as the tide was favorable, proceeded on our way. At 8.40, the ship, while passing through Seymour Narrows, was caught in a whirlpool, caused by strong counter-currents, and, becoming unmanageable, (refusing to obey her helm,) was carried bodily on to a sunken rock, which she

struck with great force on the port side, about abreast of the foremast, careening the ship and starting the decks forward. The ship hanging on the rock for a moment, swung rapidly head to the current, then slipping off, was immediately headed for the shore of Vancouver Island, the nearest land.

By this time the ship was rapidly filling with water, and about the time her head struck the shore the fires were extinguished. Both bower anchors were let go and a hawser made fast from the bow to a large tree on shore. The boats having been cleared away, were now lowered, (with the exception of the steam-launch, which there was no time to hoist from its cradles,) and were used in saving such provisions and effects as could be got at. All hands were busily employed at this work until the water was above the berth-deck and it became dangerous to remain longer on board, when I gave the order for everybody to leave the ship. At 9.50 all reached the shore in safety. The vessel now sank steadily, and, at 10.16, went down stern foremost in fifty or sixty fathoms of water, carrying everything on board with her except the steam-launch, which floated from the cradles, (the falls having been unhooked beforehand,) and a few articles from the spar-deck.

I immediately dispatched my executive officer, Lieutenant-Commander M. W. Sanders, the pilot, and a boat's crew, in the first cutter, to Nanaimo or Victoria, with verbal instructions to seek assistance and to telegraph to the Department and to Rear-Admiral Rodgers the loss of the ship.

As the point at which we landed was a rocky bluff, at a distance from fresh water and unsuitable for a camp, I transferred the men and everything saved from the wreck to Valdes Island, on the opposite side of the strait, where there was a small cove and fresh water. Such shelter as boats' sails, hammocks, and brush-wood could afford were erected, but gave but little protection from almost continuous rain. All the provisions saved (forty-eight bags of bread and eight boxes of canned beef) were collected and placed in charge of the paymaster, to be served out regularly.

The accounts and money were saved, together with the ship's chronometers.

My pilot was Capt. William E. George, whose employment was authorized by Rear-Admiral Almy.

On the morning of the 22d, at 5.30 a. m., Her Majestys ship Myrmidon, commander, Hon. Richard Hare, R. N., came to our relief, closely followed by the Hudson Bay Company's steamer Otter, which had been chartered at Victoria by Lieutenant-Commander Sanders, who returned in her.

The Myrmidon anchored in the cove, and Commander Hare came on shore and tendered me every assistance in his power, stating that he was provided with a full supply of extra provisions, blankets, and bedding for the purpose. The cove being small and an unsafe anchorage, I directed the Otter to proceed through the Seymour Narrows to Plumper Bay, and transferred to that point as soon as possible, by means of the Myrmidon and my boats, officers and men, and all that had been saved from the wreck. At this time the mail-steamer California, from Sitka, came in sight, and, anchoring in the bay, offered to assist us; but, as there was already sufficient accommodations for all, I thought it proper to decline the offer with thanks. At 11.30 a. m. the Myrmidon got under way, having on board thirty officers and men, (including myself,) and three of our boats, and was followed soon after by the Otter with the remainder.

About 3 p. m., in the Straits of Georgia, we met Her Majesty's ship Repulse, bearing the flag of Rear-Admiral Cochrane, commander-in-chief in the Pacific, which was on her way to our assistance, the admiral being on board in person. Thinking he might be able either to raise the Saranac, or at least some of her guns and other articles, he had brought several divers and a large lighter, furnished with a steam fire-engine and hose.

After communicating with the admiral and informing him of the impossibility of raising the Saranac, the Myrmidon proceeded to Esquimault, and the Repulse to Burrard's Inlet. About 7 p. m. on the 23d instant, the Myrmidon anchored in Esquimault Harbor, and two hours later the Otter arrived at Victoria.

Upon my arrival at Esquimault, I was met by the United States consul, Mr. D. Eckstein, who gave me a copy of the Department's telegram of the 21st instant, stating that the United States steamer Benicia had been ordered by telegraph to the relief of the Saranac's crew. I then proceeded to Victoria and, in company with the consul, called upon his excellency Joseph W. Trutch, lieutenant-governor of the province, to pay my respects, and to express my thanks for the assistance that had been rendered us. I was unable to telegraph my arrival here until this morning, as the telegraph-office was closed when I arrived last night.

The accommodations of the dock-yard at Esquimault having been tendered me by Rear-Admiral Cochrane, I propose quartering my men there until the arrival of the Benicia, and to make such arrangements as are available for supplying them with provisions.

The Otter has gone to Esquimault this morning to transfer the remainder of the crew to the dock-yard.

I cannot speak too highly of the generous promptness shown by Admiral Cochrane in affording us relief. His first intimation of the disaster was received about 9 a. m. on the 21st instant through the newspapers, and by 1 p. m. the Myrmidon was proceeding to Seymour Narrows under a press of steam, where she arrived at 5.30 the following morning, a short time ahead of the Otter, which had left Victoria about 7 a. m. on the 21st. The admiral followed in his flag-ship, (having taken on board the appliances for raising the wreck,) leaving Esquimault about 6 p. m. on the 21st. The warmest thanks of myself, officers, and men are due to Commander Hare and the officers and crew of the Myrmidon for their courtesy, hospitality, and unwearied exertions in our behalf.

Our consul, Mr. Eckstein, deserves great praise for the energy and ability shown in rendering assistance, and has my hearty thanks.

Both officers and men behaved with the greatest coolness and efficiency at the time of the wreck, and I cannot speak too highly of their conduct throughout.

I respectfully request a court of inquiry on my arrival at San Francisco.

I have the honor to be, very respectfully, your obedient servant,

W. W. QUEEN,
Captain U. S. N.

Hon. GEO. M. ROBESON,
Secretary of the Navy, Washington, D. C.

SAN FRANCISCO, CAL.,
July 2, 1875—5 a. m.

SIR: In my communication to the Department of the 24th of June, I reported my movements from the time of my leaving Nanaimo, British

Columbia, until my arrival at Esquimault, British Columbia. I have now the honor to report what has been done since that date.

The use of the government dock-yard at Esquimault having been tendered me by Rear-Admiral Cochran, I conferred with Mr. James H. Innis, the officer in charge of the yard, who placed at my disposal a sail-loft in which to quarter the crew, and a house for the use of the officers. As soon as these arrangements had been completed, I transferred the men from the Hudson Bay Company's steamer Otter and Her Majesty's ship Myrmidon to the dock-yard.

The paymaster endeavored to arrange with outside parties for supplying the men with provisions, but being unable to do so satisfactorily, I accepted the repeated offers of Commander Hare, commanding the Myrmidon, senior naval officer present, and Mr. Innis to issue rations to them, which was accordingly done during their stay, together with some clothing and blankets to such of the men as had lost their own. Payment for the clothing and blankets was reluctantly received, but positively declined for provisions.

On the evening of the 26th the United States consul informed me that I was authorized by the Department, through a telegram to himself of that date, to charter a steamer to convey the officers and men of the Saranac to San Francisco. The Goodall, Nelson & Co.'s steamer Pacific, being in the harbor of Victoria and advertised to sail for San Francisco on the 28th, I made arrangements with the agent of the company to convey the officers and men, with their effects and their boats, for $2,500; the Pacific to touch at Esquimault to take them on board.

About 7 p. m. on the 28th I embarked with officers and men in the Pacific, and at 8 p. m. left Esquimault Harbor. Six men had left the dock-yard without permission, and not being on hand were left behind. I declared them deserters and addressed a letter to the consul concerning them, a copy of which I inclose, marked "A." I also left with the consul a letter for Captain Hopkins, in reference to five boats which I could not carry; a copy inclosed, marked "B." The British naval authorities treated us with the greatest courtesy and consideration, and spared neither time, trouble, nor expense in caring for the safety and comfort of all. On the 28th I addressed to Rear-Admiral Cochran a letter of thanks, a copy of which I inclose, marked "C."

I have the honor to inclose a copy of a report concerning the loss of the Saranac, submitted to me on the 29th by Capt. William E. George, the pilot of the ship, marked "D."

I arrived here late last night, officers and men all well, and shall proceed to the navy-yard, Mare Island, this morning.

I have the honor to be, very respectfully, your obedient servant,

W. W. QUEEN,
Captain United States Navy.

Hon. GEO. M. ROBESON,
Secretary of the Navy, Washington, D. C.

A.

ESQUIMAULT, VANCOUVER ISLAND, *June* 28, 1875.

SIR: I shall leave this eve for San Francisco on the mail-steamer Pacific, taking with me the officers and such of the crew as may be present.

As in all probability there will be a number of stragglers, they will be considered as deserters from the time of our departure, and have no claims upon the Government.

Very respectfully, your obedient servant,

W. W. QUEEN,
Captain United States Navy.

Mr. D. ECKSTEIN,
United States Consul, Victoria, V. I.

B.

ESQUIMAULT, VANCOUVER ISLAND, *June* 28, 1875.

IR: I would respectfully inform you that I leave in the steamer Pacific for San ncisco this evening, taking with me the officers and all the crew present at the time ur departure.

have also taken three boats, leaving the launch, second and fourth cutters, and dinghies for you to take down or dispose of as you deem best for the interest of Government. They are at the dock-yard, in charge of the naval authorities here.

Very respectfully, your obedient servant,

W. W. QUEEN,
Captain United States Navy.

apt. WILLIAM E. HOPKINS,
Commanding United States Steamer Benicia.

C.

ESQUIMAULT, VANCOUVER ISLAND, *June* 25, 1875.

ADMIRAL: It is my pleasing duty and very great privilege to acknowledge the ighty obligation which your generous kindness in affording such complete and edy relief to the shipwrecked officers and men under my command imposed upon me. llow me for myself and them to tender our heartfelt thanks, and to express through a the same to Commander Hare and the officers and crew of Her Majesty's ship Myrdon, for their courtesy, hospitality, and unvarying kindness.

I have the honor to be, very respectfully, your obedient servant.

W. W. QUEEN,
Captain United States Navy.

Rear-Admiral the Hon. A. A. COCHRAN, C. B.,
Commander-in-Chief the Pacific.

D.

VICTORIA, BRITISH COLUMBIA, *June* 26, 1875.

SIR: In view of the late disaster to the United States steamer Saranac, under your mmand, while attempting to pass through Seymour Narrows in my charge as pilot, I em it my duty to address this letter to you in the form of a statement embodying y view of the cause which led to the accident.

As you are aware, we left Nanaimo, British Columbia, on the evening of the 17th of ne, and proceeded north that night, with fine and clear weather. I had calculated fore leaving Nanaimo that the ship would reach the narrows at about two-thirds ebb the following morning, which would not be considered an unfavorble time for passg, as the tide would be past the greatest rush, and would give us, if the surveyor's report the depth of water over the rock is to be relied on, about 20 feet, calculating from a sis of 13 feet rise and fall and 15 feet on the rock at extreme low water, the est report of survey.

We reached the narrows, at the time calculated on, and upon approaching them I rested the executive officer, Mr. Sanders, to have the relieving-tackles hooked and nned by reliable men, and the most experienced quartermaster at the wheel; at the e time to increase the speed of the ship to the fullest capacity; all of which was e.

hen the entrance to the narrows was reached, at about 8.30 a. m., and the ship was he strength of the current, I found directly that she was sluggish in her movements, to obey her helm, although the current was not so rapid as on former occasions n I had taken the ship through. Immediately on entering, the ship took a broad r toward the right-hand shore, (Maud Island,) but with the helm hard to starboard vered the sheer, only to sheer wildly to port, (toward the rock.) I shifted the helm dly, as she sheered, to hard to port, the current at the same time setting toward the . The ship had just begun to break the sheer with helm hard to port when she struck he port side forward and the current swung her round with great violence, with her l to the Vancouver shore, when she was forced clear of the rock. I immediately gested to Mr. Sanders to take the ship into Plumper's Bay, about a mile distant, but report from below showed that the ship would scarcely float even for that short e of time. The order was then given to go ahead four bells, (full speed,) and as she headed for the Vancouver shore soon struck the beach. The after occurrences, with

the great order, promptness, and discipline which prevailed for the few moments the ship remained afloat, it is not necessary for me to mention, although it excited my admiration.

You will see from this statement that I attribute the disaster to the refusal of the ship to obey her helm readily, consequent on her not having speed enough to govern her motions in a strong current.

I have the honor to remain, with respect,

WM. E. GEORGE.

Capt. W. W. QUEEN, U. S. N.

YELLOW FEVER ON THE LANCASTER.

UNITED STATES STEAMER LANCASTER, (2d rate,)
Bahia, Brazil, May 10, 1875.

SIR: I respectfully inform the Department that I arrived at this port on the 9th of May, being on my passage from Rio de Janeiro to the United States, under orders received from Rear-Admiral Le Roy, of the South Atlantic station.

I sailed from Rio de Janeiro on the morning of April 22. At sea, on the 28th of April, Lieut. Matthew Bolles was returned on the medical report as ill with catarrh; on the 29th Master J. B. Murdock was returned on the report for the same illness; on the 29th also Medical Inspector E. R. Denby was reported down with fever; and on the 30th of April these three cases were pronounced to be yellow fever.

Lieutenant Bolles went into black vomit for two days, and died on the 2d of May, at 9.9 p. m.

Dr. Denby had no black vomit, but grew rapidly weaker until the 3d of May, when he died, at 10.23 a. m. Master Murdock, in the mean time, was soon pronounced to be out of all danger, his attack being quite light.

On the 3d of May, in the evening of the same day that Dr. Denby died, Asst. Surg. B. F. Fassig was taken down with yellow fever, taken no doubt from too close attention to Mr. Bolles during the period of his black vomit.

On the 4th of May Acting Passed Asst. Surg. F. V. Greene was the only medical officer left us for duty. There seemed to be, at this juncture, a probability that the terrible disease would become a contagion, and spread in the ship among a crew of some four hundred souls. The ship had an immense distance to run to reach a home-port. Dr. Greene himself had never had yellow fever, and was growing haggard and exhausted from unremitting labor, night and day, for five days, and, as he plainly said to me himself, there was a great probability that he, too, would be smitten down, and the ship would thus be left with some four hundred precious lives, exposed to the ravages of yellow fever, with no person whatever competent to prescribe for or save them. All this, coupled with the urgent request of Dr. Greene, gave me no moment for indecision, and I shaped a course directly for Bahia, Brazil. At this time we were four hundred miles nearly due east of our port, and it was known to possess the best yellow-fever hospital and most competent physicians in the empire. There was no other port available short of Saint Thomas, and that port I could not reach in this ship for weeks, as I had left Rio short of coal, and the ship cannot even hold her own unless she has a free fair wind. Up to this time there had been no southeast trades, but light breezes and airs from northeast by east to east-southeast.

I arrived in this port, as above stated, on the morning of the 9th of May. On the same day Dr. Fassig and Mr. Murdock were landed at

the hospital, and taken in charge by its physicians, and the ship was placed in quarantine.

Up to this date, no symptoms whatever have manifested themselves among the ship's company. There never was a ship in our Navy in a better sanitary condition than the Lancaster since March, 1874. I am fully persuaded that the disease was brought into the ship by Lieutenant Bolles, who had been exposed in Rio Janeiro. Dr. Denby had been an invalid ever since he joined the ship in Key West, and if he had possessed ordinary health and strength, I have no doubt he would easily have survived. His attack, I think, was very light, as was that of Mr. Murdock. Although there have been so few cases of this sickness on board, I am surprised to learn from Dr. Greene that medical stores, and medicines also, are gravely needed. It would appear that the fleet-surgeon did not supply the ship under the supposition that any contingency of yellow fever aboard might arise.

It is my purpose to fill up with coal, provisions, medical supplies, and, if Dr. Fassig does not recover, it will become necessary to procure a surgeon here to assist Dr. Greene to carry the ship home. As no case has occurred among the crew, as the origin of the cases we have had can be easily traced to special exposure of the persons attacked, and as it is now eighteen days since we left Rio, I feel quite assured that we have arrived at the end of our calamities. Since Dr. Fassig's removal, the ship has been thoroughly cleansed and fumigated.

The weather here is so cool that we are wearing our heavy woolen clothing, and a blanket at night is needed. Bahia is absolutely healthy, and while yellow fever ranges all along the coast above and below, there is none here.

I hope the Department will be pleased to approve of my action. It will delay my arrival in the United States perhaps two or three weeks, but it cannot be helped.

I have the honor to be, sir, very respectfully, your obedient servant,

F. A. ROE,
Captain, United States Navy.

HON. GEO. M. ROBESON,
Secretary of the Navy, Washington, D. C.

UNITED STATES STEAMER LANCASTER, (2d rate,)
Port of Bahia, Brazil, May 18, 1875.

SIR: It is my painful duty to report to the Department that, since my communication of May 10, Asst. Surg. B. F. Fassig died of yellow fever. He was removed to the hospital on shore on the 9th, and died there on the 11th. Since Dr. Fassig was taken down, no other cases have occurred, and we have no symptoms at present of further progress of the infection. The ship has been most carefully and thoroughly cleansed, and disinfectants used, and I hope to have no renewal of the disease on board.

I shall leave this port on the 20th instant and proceed on my homeward-bound cruise. I feel that there is an unusual weight of serious responsibility on me in getting the Lancaster home.

* * * * * * *

I have the honor to be, sir, very respectfully, your obedient servant,

F. A. ROE,
Captain Commanding.

HON. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

UNITED STATES STEAMER LANCASTER,
Port of Bahia, Brazil, May 18, 1875

SIR: The Baron Ivanheimer, commodore, commanding the Brazil squadron here, having learned of the loss by death of two surgeons this ship, very courteously tendered me the services of the surgeon of flag-ship to accompany us to the United States, and I have believe to be my duty to accept them.

Although we hope that the yellow fever may have left us with its l victim, the possibility remains that it may re-appear in our mi Should such a calamity happen, with the large number of men we h on board, I do not regard it as safe to put to sea on a long pass through the equatorial regions with only one surgeon.

I have guaranteed his return passage from New York by first stea after our arrival in the United States.

I have the honor to be, sir, very respectfully,

F. A. ROE,
Captai

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

UNITED STATES STEAMER LANCASTER, (2d rate.)
Norfolk, Va., June 25, 187

SIR: I have the honor to report to the Department the safe arri at this port of the United States steamer Lancaster, under my c mand.

The last case of yellow fever occurred on the 3d of May, since wh time no new cases or symptoms of the disease have appeared, and ship is and has been in her usual good sanitary condition.

I have the honor to be, sir, very respectfully, your obedient serva

F. A. ROE,
Captai

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

GALLANT CONDUCT OF MIDSHIPMAN ARNOT HENDERSON, OF HER BRIT NIC MAJESTY'S NAVY.

No. 15.] NORTH PACIFIC STATION,
UNITED STATES FLAG-SHIP PENSACOLA,
Honolulu, Hawaiian Islands, February 17, 1875

SIR: Herewith I transmit correspondence connected with the falli from aloft and drowning of William Wilson, an ordinary seaman of United States ship Tuscarora, and the gallant conduct of Navigati Midshipman Arnot Henderson, of Her Majesty's ship Tenedos, w upon s eing the man fall, jumped overboard and swam to the Tuscar a dista ce of a hundred yards, and dived for the body until almost hausted but without success in bringing it up. This event occurre the port of Honolulu on the 26th of January, 1875.

In addition to the high appreciation expressed by Captain Er officers, and crew of the Tuscarora, I beg leave, as commander-in-ch to add my own, and most earnestly request the Hon. Secretary of

Navy to bring to the notice of the British government the heroic and spirited behavior of Midshipman Arnot Henderson, R. N., of Her Majesty's ship Tenedos, upon the occasion.

I am, very respectfully, your obedient servant,

JOHN. J. ALMY,
Rear Admiral U. S. N.,
Commanding U. S. Navy force, North Pacific Station.

Hon. GEORGE M. ROBESON,
Secretary of the Navy, Washington, D. C.

UNITED STATES STEAMER TUSCARORA, (3d rate,)
Off Honolulu, Hawaiian Islands, January 3, 1875.

SIR: I have to report the death of William Wilson, an ordinary seaman attached to this vessel. His death occurred on the 26th instant, and was caused by falling from the fore-top mast cross-trees, his head striking upon an iron ratline and from thence bounding overboard, while in the act of laying down from aloft, after sending down top-gallant yards. His body was recovered and buried on the 27th instant. In connection with the above I should like to call your attention to the gallant conduct of navigating midshipman Arnot Henderson, of the Tenedos, who, seeing him fall, jumped overboard and swam to the ship, a distance of about one hundred yards, and dived for the body until almost exhausted. I inclose herewith a copy of a letter from the crew of this vessel to navigating midshipman Henderson. I forwarded the original to Captain Pollard, of the Tenedos, at the same time expressing my appreciation of the gallant conduct of the young man. Inclosed is a copy of Captain Pollard's letter to me, in reply.

I am sir, very respectfully, your obedient servant,

H. ERBEN, JR.,
Commander, Commanding.

Rear-Admiral JOHN J. ALMY,
Commanding U. S. Naval Force, Northern Pacific Station, &c., &c.

Respecting the gallant conduct of Mr. A. Henderson, navigating midshipman.

HER MAJESTY'S STEAMER TENEDOS,
at Honolulu, January 30, 1875.

SIR: I have much pleasure in acknowledging the receipt of your letter of yesterday's date, expressing your high appreciation of the conduct of Mr. Henderson, navigating midshipman of this ship, of the 26th instant, also of the inclosure—a letter addressed to Mr. Henderson by your ship's company, in which they so heartily speak of his gallant efforts to save their unfortunate shipmate, who had fallen overboard from aloft and was drowned that evening.

2. These letters I have had great pleasure in reading to Mr. Henderson on the quarter-deck, and that officer begs me to thank you, sir, and also your ship's company, for their expression of approbation of his exertions.

3. I will lay these letters before my commander-in-chief, who will, I am sure, be much gratified, and I confidently hope the lords commissioners of the admiralty will bestow on Mr. Henderson some mark of their approval of his gallant conduct.

I have the honor to be, sir, your most obedient servant,

EDWIN POLLARD,
Captain Her Majesty's Steamer Tenedos.

Commander HENRY ERBEN. U. S. N.,
Commanding United States Steamer Tuscarora.

UNITED STATES STEAMER TUSCARORA, (3d rate,)
Honolulu, Hawaiian Islands, January 29, 1875.

SIR: It is with much pleasure that I undertake the task which has devolved on me of tendering to you the sincere and heartfelt thanks of the crew of this ship for your noble and praiseworthy efforts to rescue from drowning our unfortunate shipmate, on

the evening of the 26th instant. Rest assured sir, we shall over cherish the memo of your gallant conduct on that unfortunate occasion, and ever hope that your futu career may be prosperous and happy, the due reward of a brave man.

In behalf of the ship's company of the United States Steamer Tuscarora.

I am, sir, very respectfully, your obedient servant,

THEODORE HOFF,
Orderly Sergeant United States Marine Corps.

A. HENDERSON,
Navigating Midshipman Royal Navy, H. B. M. S. Tenedos, Honolulu, H. I.

No. 15.

REPORT OF ADMIRAL D. D. PORTER.

WASHINGTON, D. C., *November* 15, 1875.

SIR: I have the honor to inclose herewith my annual report toget with a list of iron clads of the different navies of the world.

I have the honor to be, very respectfully, your obedient serva

DAVID D. PORTER,
Admira l.

Hon. GEORGE M. ROBESON,
Secretary of the Navy.

WASHINGTON, D. C., *November* 13, 187.

SIR: I beg leave herewith to submit my annual report.

The proper inspections of ships going to and returning from se have been made, and a fair condition in all requisites has been exh ibi ted, excepting in the exercises of sails and spars. The infrequency o these exercises of late has caused a material falling off in the efficiency of our naval vessels.

The reports of exercises are now so meager that they merely serve to show how very little is done in this direction, and the impossibility of keeping up proper drill and discipline, without stringent orders and constant surveillance; so that these important matters shall not be neglected, owing to the indifference of those who do not appreciate their necessity.

I fear that general order No. 189 has been misconstrued, and that in flag-ships especially, exercises aloft have not been frequent, on the plea that said order only calls for them occasionally, and that the sails and running gear are recommended to be unbent and stowed away whenever it will benefit them to be under cover. The general-order, then, seems to discourage these exercises, so important to the navy; at least, such is the prevailing opinion, and I would, therefore, suggest that it be so far modified as to renew general-order No. 128, and that the exercises of lower yards and top-masts take place every two months or six times a year.

In the year 1842, it was the custom in the Mediterranean squadron to send down royal and topgallant yards and masts, lower yards and topmasts every day at sunset, and send them up again every morning, the former operation requiring five minutes, the latter nine, and these exercises were not considered troublesome, or detrimental to the masts and yards.

Within the past three years we have had several ships, the Colorado, Alaska, and others, that have prided themselves on doing quite as well as those I have instanced above.

It must not be forgotten that in time of war, ships provided with sail and steam power will be required to go into a fight at short notice, and having to proceed under steam, it will be necessary to strip for action, which can only be accomplished with rapidity by those who have previously paid attention to the exercises.

I am pleased to say that in no instance has there been found any neglect of ordnance exercises, and generally, in this respect, the vessels of the navy have been exceedingly well drilled.

Comparisons are often considered invidious, but I deem it due to Captain Barrett, of the Canandaigua, and Captain Harmony, and others who have commanded the Hartford, to draw your attention to the great care exercised by these officers in the preservation of their ships, and to the admirable condition in which every department on board these vessels was found.

For many years past our receiving-ship system has been most inefficiently conducted, and the substitution of the larger class of frigates kept ready for service, is a step in the right direction. The old hulks formerly used for the reception of recruits contained none of the elements of ships of war, and afforded few facilities for training men. They were wanting in many of the comforts of cruising vessels, and were almost entirely deficient in that discipline so essential to men crowded together on shipboard.

By the substitution of first-class vessels in place of the old hulks, the Government can rely on having several large ships ready for immediate service near home, while their places as flag ships abroad can be better supplied by a smaller and less expensive kind of vessel.

Of the four large frigates to be used as instruction and receiving ships, the Wabash, at Boston, is sound in the hull, but her engines and boilers are worn out. The Colorado, at New York, is unsound in her upper works, her main boilers are somewhat worn, and her superheaters are out of repair, but her engines are in good condition.

The Minnesota, at New York, used as a flag-ship for the Vice-Admiral, and as an instruction-ship for boys, is sound in hull, and the machinery is in good order. The Sabine is in good condition.

The defects in these vessels should be made good, for, although useless to contend with the new style of iron-clads, and for want of steam-power incapable of acting efficiently against the commerce of an enemy, yet in an emergency they would serve a useful purpose near home until such time as we could substitute for them ships of greater force that would properly indicate the naval strength of the nation.

The best step towards the advancement of the naval service is the organization of the school of instruction for boys on board the Minnesota, at New York. This school has been started under such favorable auspices as to create the hope that the system will be so extended as to meet the pressing requirements of the Navy.

If the system thus inaugurated is carried out, it will place our Navy on a proportional footing with those of other powers, and will introduce into the service a class of petty officers and seamen, the want of which has been seriously felt for many years.

A careful examination of the Minnesota demonstrated that the system of instruction was working most successfully. The boys are well instructed by naval chaplains in the rudiments of an English education, in seamanship by the boatswain, and in ordnance by the gunners. They

are well drilled and disciplined by line officers, and the system, although in its infancy, gives every promise of success.

The boys already enlisted are active, intelligent lads, of fine physique, and good moral character, and are contented with their situation, which is really a great advantage to them. Something, however, is still required to bring the apprentice system to perfection.

On several previous occasions we have established such a system on a small scale, but for want of legislation by Congress, and from the unwise opposition of several naval officers, the scheme has invariably proved abortive. It will require more than a departmental interest to make this present attempt to man the Navy with native Americans a success, and a greater number of boys must be allowed than are at present authorized.

I have several times brought to the notice of the Department the necessity of establishing, by law, a *permanent* apprentice system—one that will not be injuriously affected by any changes in the administration of the Navy, and I have never hesitated to recommend that two thousand boys should be allowed, as an economical method of supplying the Navy with seamen upon whom the country could rely in time of war. * * * * *

The present arrangement with regard to apprentices is the best that has ever been established, and I can see no reason why it should not now become permanent, the impracticable features of former systems having in this instance been excluded.

It is difficult to form an adequate idea of the disagreeable position of a commanding officer abroad, who is surrounded on the deck of his ship by men of many nationalities, who have little attachment to the flag flying from the peak, and who, in many cases, are ignorant of the language in which orders are given. An officer can hardly take much pride in commanding a ship manned by such cosmopolitans.

Fortunately we have not yet been placed in a position to experience serious results from this state of affairs, such as a refusal to defend the flag, or other mutinous conduct, but there is every reason to suppose that in case of war with a foreign power we should not be exempt from this difficulty. Our heterogeneous crews might decline to fight, on the ground that they had not enlisted for war, and a state of things would be brought about which could never occur were our ships manned by *bona fide* American citizens, in whom the love of their country's flag is at least as strong as it is in the breast of any other nation.

The system of manning a navy with native-born seamen was long ago brought to perfection in Great Britain, and no other regulations are necessary further than those I laid before you in my annual report for 1872, which were based on the British system, with such necessary modifications as would adapt it to our particular naval policy.

It remains now for Congress to take an interest in this most important matter and enact laws to keep the number of enlisted boys at two thousand, until we have a body of ten thousand petty officers and seamen, after which the number of apprentices could be limited to keep up a general supply.

To say nothing of the advantage to the naval service, the benefit to the country at large must be considered in thus establishing, without material expense, a school from which to graduate a good class of officers for the merchant-marine; for, by culling the good from the bad, the apprentice-system would in a few years produce a fine set of men, who, although not sufficiently educated to hold the position of commissioned officers in the Navy, would be well qualified for subordinate positions

ɜewhere when their terms of service had expired. Graduates from the prentice-school having been brought up in the Navy, would carry with ɜm into the merchant-marine that strict discipline, for the want of ıich so many difficulties are constantly occurring on shipboard.

Our country can easily furnish a sufficient number of boys of good ıracter for the purpose I have indicated, and even now parents are ·ing aside the natural objections they have hitherto held against plac- ; their sons in the Navy, and are coming forward to offer them for the fense of their country.

[t may seem unreasonable to find fault with a system which has rdly had time to get fairly under way, but my excuse must be the ɜat desire I have to see a perfect plan adopted without delay, em- acing such provision for the apprentice-boys that parents can raise no jections whatever to their enlistment.

It is not desirable, on their admission into the service, to have these ıuths come in contact with vice in any form, yet this can scarcely be ·oided when the drill-ship is also used as a recruiting-vessel for sea- en and for the assembling of a large number of enlisted men previous their being sent on a cruise. The boys are necessarily thrown in ntact with these men, among whom are some bad characters, and the ıpressions the youths receive through such association are very detri- ental to them. This is unfair to the parents of the boys, who have a ght to presume that their sons will not be subjected to immoral in- ɜences, and if this association is continued it will greatly add to the fficulties of permanently establishing a good system. I would, there- re, recommend that drill-ships for boys be used for no other purpose.

I would further suggest that each drill-ship have attached to her a ıick-working sailing-vessel of 300 tons, for the purpose of training the ›prentices at sea. These could be kept on the northern coast in sum- ɜr and on the southern coast in winter, losing no time on account of ɜather, and picking up recruits in both sections.

Especial inducements should be offered to retain the boys in the ser- ce after their term of apprenticeship has expired, and we of the Navy › not think it asking too much of Congress to legislate liberally in re- ırd to this matter, since little or nothing has hitherto been done for a ost useful class of men—the sailors of America—and the Government ould really be the greatest gainer by such action.

In former days the British navy was in a very bad condition in gard to the personnel of its seamen, but by the introduction of an ap- ·entice system, which has been fostered with great care, the service ıs been completely regenerated. I recently visited one of their large ıips, the Bellerophon, at Newport, R. I., and was much impressed ith the superior efficiency of her crew over any that we possess. Their ıip is their home and the service is their profession, in which they ex- ɜct to spend their lives. I regret to say that the attention paid by the ritish to the comfort and happiness of their seamen, and the induce- ents offered the latter to remain in the service, offer a strong contrast › the state of things prevailing in the United States Navy.

I take this opportunity to commend Capt. A. W. Johnson for the zeal ıd intelligence evinced by him in the inauguration of a system of ap- ·enticeship so important to the Navy, and I am satisfied that, with ›od instructors, the plan cannot be otherwise than successful.

I beg leave to draw your attention to the double-turreted monitors ›w being repaired, and to offer some suggestions, that if followed will, think, go far to make them the most effective vessels of their class loat. In the alteration of the smaller monitors, everything has been

done of which they were susceptible, as it was impossible to convert them into very effective vessels. They are but light skirmishers at best, and can never play an important part in war. They were built for ascending our rivers during the late conflict, and answered very well the purpose for which they were intended; but since they were designed, the science of ordnance has made such advances that they are now comparatively weak vessels. In future the smaller monitors may be useful in connection with forts for the defence of our harbors, but cannot be depended upon to take part in a line of battle.

In the fleet maneuvers near Key West, these vessels attained only a speed of six knots. Their smooth-bore guns will only damage the four-inch iron-clad within an area of 900 yards, so that, at the most, these monitors can only be considered as auxiliary defences, not to be depended upon in cases where the honor and success of the Navy are concerned.

The construction of such vessels ought not to form part of the policy governing the Navy of to-day, for, like the original Monitor, they are almost things of the past. Appearing at a fortunate moment, the Monitor did good work for the nation, and established such a reputation as led our people to believe in its eternal fitness for all naval war purposes, but in truth the original Monitor, if in existence to-day, would not stand one shot from the average rifle-gun, and could be run over and sunk by an ordinary iron-clad as easily as a river steamer would run over a yawl-boat.

The double-turreted monitors, however, offer a greater scope for the talents of constructors and engineers, provided they duly consider what will be required of these vessels.

Foreign navies have about reached the point where an average class of gun will be used by them. The largest now in use, which can be worked with rapidity, is the 12-inch wrought-iron muzzle-loader of 35 tons weight.

In making changes, it should be our aim to resist the shot from this gun, which at 200 yards perforates 15 inches of solid wrought iron, backed by 18 inches of hard wood and a skin of 1¼ inches iron plate; otherwise, the double-turreted monitors, when completed, represent an inferior power little more effective than the smaller vessels of the class, and one of them would be incapable of resisting the combined attack of two of the latter. If the monitors have not great speed, they will be inferior to a fast half-armored vessel that can keep her distance, while gradually knocking them to pieces with 9-inch 12-ton guns.

There is now an opportunity to commence what has long been advocated, namely, the construction of a class of vessels that could appear in line of battle, twenty-four of which would represent the naval strength of this nation, as the twenty-four heaviest iron-clads of England and France indicate the naval power of those countries, and constitute a force that would drive an enemy from their shores.

During the naval contests between England and France, their respective powers were estimated according to the number of ships of the line frigates, sloops-of-war being considered in the light of dispatch-vessels, or eyes to the fleets, and they did not take part in the great engagements, except to tow crippled ships or prizes out of action. It will be so with all monitors that cannot resist the heaviest iron-clads; they will be unfit to enter a line of battle, incapable of preventing the entry of our ports by an enemy, and unable to cope with the heavy guns of ordinary forts. They will therefore represent no decided power either for offense or defense, unless provided with a shield of iron and

wood sufficient to resist the average rifle-gun, and with speed to get within striking-distance of an enemy.

No matter how many wooden vessels, with fair batteries, we may possess, they add nothing to our fighting force except against light-armed ships like themselves and merchant-vessels, nor would they avail anything to keep an enemy out of our harbors, or to attack forts armed with modern ordnance. They are vulnerable at all points, and are in danger equally from shots entering their boilers and powder-magazines.

Formidable as were frigates a few years ago to cut up commerce and to overcome heavy privateers, any engagements they fought on the ocean did not materially affect the result of the war. In the hostilities between Great Britain and France, the former crushed the great fleets of her rival, causing the smaller ships to take shelter under forts and in secure harbors, which goes to show that the power of a navy was in its ships-of-the-line, and not in its smaller vessels.

The exigencies of the late war caused many variations in the planning and building of our large monitors, but there is now an opportunity to rebuild them all on approved plans that will meet every requirement. I would, however, recommend that, before this work is largely entered into, the professional knowledge of the officers who in time of war will have to fight these vessels, be made available in their reconstruction.

Many mistakes were committed in the plans and construction of our monitors, and over $20,000,000 were wasted on a collection of "light-draught monitors," which, when finished, could not bear the weight of their guns or turrets. When we add to the enormous amount thus lost the ten millions worth of wooden monitors and other vessels that rotted on the stocks, we have a sum thrown away that would have given us twenty-four properly-built iron-clads, and established without cavil our naval power for years to come.

At present the United States stand No. 9 on the list of naval powers, but taking into consideration the amount of money we have wasted in mistakes, we are the third naval power of the world in point of expense.

In view of such a vast outlay since the year 1861, resulting in so little profit, does it not strike you that something is wanting to bring our naval system to perfection, and that the professional knowledge of officers of reputation should be made available in order to produce vessels that might at least be able to float?

Other nations, it is true, have made mistakes, for the iron-clad problem was a new one and at first difficult of solution, but none have suffered as much as ourselves from errors in construction, and none could so illy afford it.

Every monitor that was laid down during the late war is now a legitimate subject for reconstruction. Some of them were great vessels in their day, and reflect no discredit on any one for the mistakes in their construction, which were not then so apparent as at present. We could rebuild, from the materials of the double-turreted monitors, vessels that would hold their own in any line of battle.

For fighting purposes I prefer turreted vessels, of the monitor class, to any others; and the more I examine the various systems of foreign navies, the more I am convinced that we started on the right plan for coast-defense, and should now perfect it by building vessels unsurpassed in invulnerability, guns, and speed, and with a crushing-power that nothing can withstand.

The plan of placing the pilot-house on the top of a monitor's turret

shows a lack of ingenuity, for this is the most exposed point in the vessel, and is liable to be swept away by the first heavy shot that strikes.

I would recommend that the steering-apparatus be placed below, with a small portion of the deck above it raised and heavily plated, with apertures to look through, whence the commanding officer could communicate directly with the turret, or give orders from that quarter or from the deck to the helmsman. Above all things, the helm should be made secure against damage; and by putting the steering-apparatus on top of the turret, the inventor went out of his way to avoid a very simple plan.

Another defect in the large monitors is the heavy iron bridge which passes from one turret to the other. It is well to have something of the kind, but it should be very light, and only wide enough for a man to pass along. No one can reasonably expect to find any luxuries on board these fighting-machines, which are kept for use in emergencies, and in case of an invasion would only be employed at the entrances of our harbors along our coast.

There was one feature of the original monitor which, I think, for a fighting-vessel, was an excellent one; namely, the "overhang" on the side, which prevented the hull being penetrated if the vessel was struck by a ram. The value of this contrivance was shown in the contest at Hampton Roads, where the Merrimac rammed the Monitor, merely turning the latter half way round, and doing her no damage whatever. The overhang also adds to the stability, and protects the vessel's sides against shot.

All these matters deserve the greatest attention, and we should exhibit our ingenuity in the further improvement of these vessels, and not follow blindly the plans laid down some thirteen years ago, which, though effective against the then existing navies of Europe, have been so far outstripped that they can only be considered as types of a past age.

We of the Navy regret to see no evidence as yet that we are to have the average rifle-gun in the service, and the 35-ton gun for the monitors. These vessels may be made invulnerable, and yet will be of inferior force while they continue to be armed altogether with smooth-bore guns, which are only serviceable at close quarters. Great anxiety is felt by naval officers on this subject, and if we should be caught in an emergency without rifled guns the whole world will be amazed at our indifference to so important a matter. Six hundred thousand dollars is little enough for Congress to give the Navy to provide for this great necessity.

I would recommend the construction of several more torpedo-vessels on the model of the Alarm, with improvements. As regards speed, the vessel in question is not quite up to my ideas, but her sea-going qualities are unsurpassed. She could not founder unless cut in two by another vessel, and if properly handled in action would stand a number of shots without receiving material damage.

Of course it is out of the question to make a torpedo-vessel invulnerable, and at the same time give her sea-going qualities, speed, and the power of working quickly.

You witnessed the performance of the Alarm in Newport Harbor, and the facility with which she entirely demolished a hulk by the use of a few pounds of powder, which was not even in contact. She can fire with safety 40 pounds of dynamite, or 100 pounds of gun-cotton, equal to 200 pounds of powder, an explosion which, if properly delivered, no vessel can withstand.

Although I have not yet succeeded in obtaining as much speed from the Alarm as she is capable of, it is because she has never yet carrie

the steam her boilers are calculated steadily to carry, by 25 pounds, notwithstanding which she has made twelve knots per hour on a measured mile, and will make nine and a half knots steadily, with moderate steam, in smooth water. She has heretofore carried a wide rudder, which is a great drawback, diminishing her speed very much by the reaction of the water from her wheel against it. I shall remove this obstacle and expect better results hereafter.

The rudder in question was merely put in the vessel to steer by while she was being towed to Washington, and, as it is keyed in, it has been found difficult to unship without going into dock.

While the world is discussing the project of a safe sea-going steamer, I beg leave to present this plan as one which can be little affected by the elements. It would be impossible to sink a ship constructed in this manner by the ordinary accidents at sea, and she could only be sent to the bottom by another vessel running her down and cutting her in two, a liability from which not even the strongest is exempt.

Even in a gale of wind the Alarm rides the waves like a cork, as was demonstrated on her passage to Washington. She has six water-tight bulk-heads athwartships and nine water-tight compartments between the skins, that is nine on each side and nine between the bottom skin, or eight water-tight frames. There is no racking, jerking, or pitching in a gale, and it is believed that no stronger vessel was ever built. She certainly does credit to those who had charge of her construction, and is a proof of the skill of the mechanics in the New York navy-yard. I believe that a ship on the principle of the Alarm, built for the merchant passenger-trade, would run with safety for years, carry her cargo perfectly dry, and be the most popular passenger-ship afloat.

In this age of fast steamers and avaricious owners, the subject requires serious consideration, for the lives and comfort of thousands are daily imperiled in the dangerous machines which transport them across the ocean, and such terrible calamities have occurred through the use of inefficient passenger-vessels, that although this is not exactly a matter for naval interference, I deem the present a good opportunity to draw public attention to the subject.

Last summer I inspected at Nantasket Beach, Massachusetts, the Rider life-raft, improved under my direction for use in the Navy, for which a certain number have been ordered. As a test of the capacity of the raft it was fitted with a sail and dispatched from New York to the Isles of Shoals, off Portsmouth, N. H., through the average weather of the season, and some of the way it was pretty rough, after which she returned under sail to Nantasket, where I found her, after her hard usage, in perfect order. This raft could sustain in the water fifty persons, and could be lifted and carried by four men. With practice, such a raft could be put together and inflated in ten minutes. She sails quite as well as an ordinary boat, and is much safer. After the raft left me, it proceeded under sail to Long Branch, where, with several persons on board, it landed on the beach through a heavy surf. Altogether, nothing could be more satisfactory than its performance.

No ship in the Navy is supplied with boats sufficient to transport all her crew in harbor, much less at sea, and the value of such a life-saving apparatus as the one in question cannot be overestimated. If you will remember, I have labored earnestly to have our ships provided with the proper life-preserving apparatus, for I know how much more cheerfully and fearlessly a sailor will do his duty when he knows that his life is looked after. The perils of the deep are many and great, and it is as little as we can do, when we send a ship to sea, to give the men a chance for their lives in case of disaster.

During the past summer I visited an ocean passenger-steamer, and was surprised to find that she had not a single life-raft on board, but instead, a number of unwieldy boats, liable to be stove in a sea-way while being lowered. The introduction of life-rafts would be the means of saving many lives in passenger-vessels. It is an easy matter to throw a raft overboard that cannot by any possibility be stove, and lower the shipwrecked people down to it. Those who jump frantically overboard have a soft place to fall, with plenty of life-lines hanging from the raft. No matter how high the sea is running, or how much the raft bumps against the ship, nothing gives way; there are no ribs to break, and the life-preserver hangs by the wreck, a safe shelter for all who manage to reach it.

The great loss of life in the wreck of passenger-steamers is generally due to the people crowding into the boats while lowering, and burdening them with a weight their tackles are not calculated to bear. It is difficult to lower a boat in a sea-way, with only its crew on board; how much greater, then, the difficulty when crowded with frightened people. In a large majority of cases the boats swamp when they touch the water. Sometimes a cowardly crew will launch a part of the boats and provide for their own safety, leaving the passengers to look out for themselves. There are, perhaps, a number of boats on deck and in their chocks, with tackles and stoppers secured and covered with canvas, which defy the inexperience of landsmen or embryo sailors to get them into the water. There is nothing, however, to prevent any man from pitching a Rider life-raft overboard with a rope attached. No matter which side comes uppermost, it is the right side, provided with oars, steering-apparatus, life-lines, and a secure footing. Boats may be useful to take passengers from life-rafts after the latter have relieved them from the ship, but it is the merest chance when a boat full of people escapes from a ship's side in a gale of wind.

In all we do in the Navy, great care is taken. Our passages are not made in a hurry. In gales of wind we lie to carefully, and seldom lose a ropeyarn; but should such a catastrophe occur as happened to Her Majesty's ship Vanguard, then we require the life-rafts. If a ship suddenly plunges under water, she carries her boats all down with her, unless they happen to be cast adrift at the moment and ready for lowering. Not so with the life-raft. A stroke with a jack-knife cuts its fastenings, and it floats safely amid all the *débris* of the wreck, offering an asylum to such unfortunates as may be struggling in the water. One raft of this description would have saved the lives of all the passengers of the ill-fated Schiller when she was lately lost on the Scilly Islands. Her boats were crushed alongside, where a Rider raft would have floated in safety. It is due, then, to the Navy that these rafts and their appliances be put on board every ship of war. If they should not be needed, so much the better. They will last, with care, for ten years. The Navy Department, it is true, has no control over the affairs of the merchant-marine; but in view of the interest of our traveling public in this question, I would ask whether we do not owe it to the lives of our citizens to secure the enactment of laws that all passenger-ships sailing from our ports be provided with at least two gutta-percha life-rafts of approved pattern.

I would respectfully call your attention to the improper manner in which the smoke-stacks of vessels of war are placed, so that the main-sail cannot be used at all, while the other sails and yards on the main-mast are destroyed by heat.

For years the attempt has been made to obtain a cruising ship of war which should combine sail and steam power, for without a proper combi-

tion of both elements no vessel is fit for cruising. When we succeed in arring a ship properly we are pretty sure to place the smoke-stack in ch a position as to render the sails unserviceable, or if we succeed in the eam department there is some drawback in the construction. Hence, ice the introduction of steam we have never built a perfect ship of war. e constructor or the engineer gets the advantage one of the other, to e detriment of the vessel in hand; when, if the matter was submitted a neutral party, who would see the necessity of compromising in mat-s of such vital importance to the Navy, it might be easily arranged.

In time of war we must depend on cruising vessels to cut up an ene-y's commerce. For this purpose they must be able to keep the sea for ng periods and go great distances from home, and it is absolutely cessary that the smoke-stacks should lower below the bulwarks, and ould be a sufficient distance forward of the mainmast to preserve the ars, sails, and rigging from the heat.

While we are building new ships we are not advancing in the matter speed, the great requisite of a cruising ship of war; and we should, erefore, neglect nothing that will add to the sail-power or secure a ppy combination of steam and sail when occasion may require.

While referring to this matter of speed, I would call your attention to class of vessels that are dropping out of the service. I allude to the ongress class, the most efficient kind of ships we have had in the Navy, d the model of which for steaming and sailing cannot be surpassed. ll these vessels want is a little more beam, steam, and sail to make em the fastest afloat. I recommend that they be rebuilt of live-oak, taining nearly their present shape, and giving them additional steam-wer, and that they be kept on the stocks until wanted. For cruising rposes this class of vessels will be found the most serviceable. They quire comparatively few men, and have good accommodations for offi-rs and crew. They have spar-decks, a fair capacity for coal, and make od speed under half their boilers.

For the general increase of the Navy I recommend, besides those to rebuilt, that twelve ships of this class be constructed of iron, and pt on the stocks ready for sheathing with wood and launching at a oment's notice; their boilers fitted and their powerful machinery ored near by. Neither time nor dry-rot could affect these vessels, as ey have done the beautiful ships now decaying on the stocks, and we n always have a certainty of possessing a reserve of good cruising-ssels when necessity requires.

I am not an advocate for iron cruising-ships, as a general thing, since oden vessels have several advantages over them; but the way I have licated is the only method by which we can hope to keep up a reserve et of clippers on the stocks, without the liability of losing millions of llars' worth of ships by decay.

While the vessels lately built seem, so far, to be fair models, they e defective in not having a light spar-deck, which would add greatly the comfort and accommodation of their crews. We should build no uising-vessel of less than 1,200 tons, and none without a spar-deck to ford complete protection to the crew and enable the ship to carry a ll amount of coal, stores, and provisions for long cruises.

In case of necessity, a sufficient number of the very small class of essels can be purchased at short notice; but it is not likely that we ould require many of these, except for use in Chinese waters or on e river La Plata.

To obtain the maximum amount of speed and to enable a vessel to ep the sea in all weathers, she must be of considerably more than 600

tons measurement, which is not over twice the size of our largest tugs. Vessels smaller than this would have little power to contend against an ordinary enemy or to keep the sea.

The fine live-oak frame of the Niagara is decaying for want of proper attention. It was originally intended, when the ship was pulled to pieces, to rebuild her with a light spar-deck, put in new and powerful engines, arm her with heavy guns, and preserve to the Navy one of the finest ships we have ever had. She would make a most formidable cruiser, if the original plans were carried out, and would have no superior of her class afloat. Her frame is worth as it stands $150,000, and that would be so much saved if the ship were rebuilt.

When vessels return from sea they have, as a rule, been laid up, and without proper care for their preservation they frequently require to be nearly rebuilt before proceeding to sea again. The proper plan would be to put a ship in thorough repair the moment her officers and crew are detached, and then, with all her equipment, ready to go on board at a moment's notice, place her in charge of an officer and a few men, who would keep her in condition for immediate service. Nothing deteriorates faster than a ship laid up in ordinary, with no one on board to look out for her.

I have on several occasions referred to the importance of a good merchant steam-marine, and the advantage properly-built passenger-vessels would be to the Navy in case of war. Unfortunately, this branch of our commerce is very far from what it should be, and at least one-half of what should properly be carried in American passenger-steamers is thrown into the hands of foreigners for the want of a liberal policy on the part of the United States Government. Our commerce has, however, taken a fresh start, and we have lately constructed, and are still building, a fine class of iron steamers, of good speed, which could be made very serviceable in destroying an enemy's commerce, or in operating as rams, in conjunction with fleets, when, seizing the opportunity, amid the confusion and din of battle, they could render good service, for the fact of a vessel being heavily plated will not save her from the blow of a very light-built steamer, which, with sufficient momentum, will go through anything that floats, with little damage to herself.

It is reasonable to assume that the number of our ocean passenger-steamers will soon increase, and it would be wise for the Government to make some arrangement so as to have a voice in the manner of their construction, by which they could be strengthened at the bow, and arranged for carrying guns. This will not in the least interfere with their capacity for transporting freight and passengers. I would recommend that the vessels in question be constructed with double bottoms and sides, and the engines and boilers so disconnected from the rest of the ship by water tight compartments athwartships and on the sides, that there would be no danger of water getting into the steam-department under ordinary circumstances. Now the first place for a steamer to leak is in her fire-room, when the fires are soon extinguished and down goes the ship.

I inclose herewith a list of vessels belonging to the iron-clad fleets of the world, which will be interesting as a reference, and to show what foreigners are doing in this direction.

I forbear to criticise any of these systems, as many are yet untried in war, but should prefer that for the present we adhere to the monitor plan, provided the vessels be of the most approved construction and of *great speed.*

No sea going iron-clad has as yet been built on a plan which I devised some ten years ago, and to which I referred in a late report. This plan provides for the construction of a vessel of low freeboard, with a heavy belt of iron above and below the water-line—say 24 inches in thickness—and a strong oak backing. In the middle of the vessel the plan provides for a 24-inch turret, and a fore-and-aft fire is to be obtained by two heavy guns, one to run out at the bow, the other at the stern. When not in action these guns are to be run away from the bow and stern to relieve those portions of the vessel from their weight. The ship will have a light spar-deck, and light, iron upper-works, all of which could be shot away without damage to hull or turret, In a gale, or under ordinary circumstances, this vessel would be closed up, with a grating over the turret to let out the smoke. In action the vessel's sides would be let down to enable the turret-guns to be fired. It may be objected that the freeboard would be too low to use the guns in rough weather; but this objection applies more to a monitor than to a vessel like the one in question. As a rule, ships do not fight in stormy weather; at such times they have all they can do to take care of themselves, and in an ordinary rough sea monitor hulls—such as this would be—roll only a few degrees, and there would be no difficulty in firing the guns from the center and ends of the ship. Such a vessel would have all the good qualities of a monitor, and would be able to keep the sea under sail. Small vessels on this plan (although I do not pretend they would sail like clippers) could be made fast under steam, and could carry four heavy guns, enabling them to reach any point under sail in case coal should run short. I venture the prediction that a similar class of vessel will finally be adopted by all nations for cruising purposes, as the iron plating of ships has about reached the extreme limit, and we must therefore return to the monitor hull.

In the contest between iron and shot, the latter has so far won the victory, just as bullets prevailed over men in armor, and the only way in which vessels can be made shot-proof is to build them with low freeboard and the heavy iron belt, the necessary thickness of which can be calculated to a nicety.

I once had the honor to call your attention to the personal inconveniences to which officers in command of our squadrons abroad are subjected from having to expend their pay or other private means for the entertainment of foreign functionaries, in reciprocating hospitalities which they cannot avoid accepting, and which they deem it a duty to return. You are doubtless aware that in foreign navies commanding officers are allowed a certain amount, in addition to their pay, for the purpose of reciprocating these civilities, it not being expected that they should defray from their private means the expense of returning what is intended as a compliment to their nation.

It is generally but once in a life-time of service that a rear-admiral obtains command of a squadron, and his satisfaction is greatly reduced from the fact that his last cruise is so expensive as to deprive him of many comforts to which he is entitled in his declining years.

It is not possible that the people of the United States expect their naval officers to impoverish themselves and families by returning hospitalities which are extended more as a compliment to this country than out of personal regard to the officers.

Respectfully submitted.

DAVID D. PORTER,
Admiral.

Hon. GEORGE M. ROBESON,
Secretary of the Navy.

NAVIES OF THE WORLD.

IRON-CLADS.

	Horse-power, nom.	N
ENGLAND.		
Achilles	1,250	5
Agincourt	1,350	5
Alexandra	.....	1
Audacious and Triumph	800	1
Bellerophon	1,000	1
Black Prince	1,250	5
Caledonia	1,000	5
Cyclops, (turret-ship)	250	
Defence	600	1
Devastation and Thunderer, (turret-ships)	800	
Dreadnaught, (turret-ship)	1,000	
Enterprise	160	
Erebus, (floating battery)	200	1
Favorite	400	1
Glatton, (turret-ship)	500	
Gorgon, and Hecate, and Hydra, (rams)	250	
Hector and Royal Alfred	800	1
Hercules	1,200	1
Hotspur, (ram)	600	
Inflexible, (turret-ship)	*8,000	
Invincible and Iron Duke	800	1
Lord Clyde and Lord Warden	1,000	1
Minotaur	1,350	5
Monarch	1,100	
Nelson and Northampton	*6,000	1
Northumberland	1,350	5
Ocean and Prince Consort	1,000	5
Pallas	600	
Penelope	600	1
Prince Albert, (turret-ship)	500	
Prince Consort	1,000	1
Repulse	800	1
Research	200	
Resistance	600	1
Royal Oak	800	5
Royal Sovereign	800	
Rupert, (ram)	700	
Scorpion and Wivern, (turrets)	350	
Shannon	*3,500	
Sultan	1,200	1
Swiftsure	800	1
Temeraire	*700	
Terror, (floating battery)	200	1
Valiant	800	1
Vesuvius, (torpedo-boat)	350	
Viper, and Vixen, and Waterwitch	160	
Warrior	1,250	5
Zealous	800	
Cerberus Magdala } For the colonies {	250	
Abyssinia } For the colonies {	200	

* Indicated.

Navies of the world—Continued.

	Horse-power, nom.	No. of guns.
FRANCE.		
o and Friedland	900	14
o, Ocean, and Suffren	950	14
ıe	800	12
	800	8
, Savoie, and Guyenne	900	12
e and Magnanime	900	12
and Revanche	900	12
ante and Valeureuse	900	12
esse and Alma	450	10
Atlante, and Indienne	450	10
d'Arc and Thetis	450	10
ıe Blanche and Montcalm	450	10
ı	480	1
ogne and Belier	530	2
ıd Cerbère	530	2
ıbeau	1,300	15
;e	1,000	34
ıble	1,500	8
ble	900	32
ıdie	900	26
ıu, Colbert, and Trident	950	14
:e	900	2
ssonniere	500	10
ıuse and Triomphante	500	10
e	357	2
ga	250	4
re and Tonnante	225	8
ıtion and Fondroyante	225	12
	225	4
and Renard (rams)	212	4
and Lepard (rams)	212	4
ade and Imprenable	120	4
rice and Refuge	120	4
ıble and Arrogante	120	6
re and Saigor	120	6
ıs, Palestro, and Peiho	150	16
, (iron-cased,) No. 5	24	2
;s, (iron-cased,) Nos. 8, 9, 10, and 11	40	2
GERMAN.		
ı I	1,150	23
inz	900	17
k Karl	950	16
h-der Grosse	850	6
Kurfuert	850	6
ı	850	6
ınd Deutsch-land	1,150	9
	450	8
ıs	300	4
dalbert	300	3
AUSTRIA.		
	1,000	12
nd Max and Harpsburg	800	14
Austria and Kaiser Max	650	12

Navies of the world -Continued.

	Horse-power, nom.	No. of guns
AUSTRIA—Continued.		
Prinz Eugan	650	
Kaiser	800	
Darche and Salamander	500	
Maros, (floating battery)		
Scitha, (floating battery)		
Erzherzog and Albrecht		
Custozza		
RUSSIAN.		
Peter the Great, (two turrets)	1,400	
Sebastopol	800	
Petropaulosk	800	
Prince Pojarski	600	
Admiral Lasareff and Admiral Greig	400	
Admiral Chichagoff, (two turrets)	400	
Admiral Speridoff, (two turrets)	400	
Minin, (two turrets)	800	
Pervenez, (battery)	300	
Touch me Not, (battery)	450	
Kremel, (battery)	360	
Minin, (corvette)	800	
Duke of Edinburgh and General Admiral	900	
Smerch and Fairy, (two turrets)	200	
Aurogan, (monitors) (one turret)	160	
Typhon and Sagittarius, (one turret)	160	
Edinorog and Ironclad (one turret)	160	
Latrick and Lava, (one turret)	160	
Peroum and Vestchum, (one turret)	160	
Witch, (one turret)	160	
Charodalika, (two turrets)	200	
Novgorod and Vice-Admiral Popoff	160	
ITALIAN.		
Re di Portogalo	800	[illegible]
Roma	900	1
Venezia	900	
Regina, Maria Pia, and Ancona	700	1
San Martino and Castelfidardo	700	1
Principe di Caniznano	600	
Messina	600	1
Conte Verde	600	
Principe Amedeo	900	
Palestro	900	
Two turret-ships	1,000	
Terrible	400	1
Formidabile	00	1
Varese	300	
Affondatore	700	
Alfredo, Cappellini, and Audace	700	
Foa di Bruno	700	
Voragine and Guerriera	150	1
La Resoluta	700	

Navies of the world—Continued.

	Horse-power, nom.	No. of guns.
HOLLAND.		
·ik der Nederlander	400	4
	400	14
horpien	400	2
Guinea	400	6
ıd Herligerlee and Bloedhond	140	2
'erberus and Hyena	140	2
'anter and Haal and Wesp	140	2
	180	2
floating battery)	60	
TURKEY AND EGYPT.		
Osmanieh	900	17
ıd Mahmoudich	900	17
k	700	8
d and Mukademme Kies	500	4
nd Muin Zaffer	400	4
et and Neghin Shefket	400	5
	400	5
ınd Hafiz Rahman	200	4
and Beksor Selim	150	2
and Ishkodrah	150	2
and two monitors	150	2
ised batteries		2
DANISH.		
	400	16
	500	24
	600	18
	235	3
	100	3
	300	2
	160	2
	100	3
	500	4
SPANISH.		
	1,000	38
	1,000	30
Victoria	1,000	30
	800	21
Aragon	600	3
	600	3
ıez	500	6
SWEDEN AND NORWAY.		
›n and Thordaen	150	2
Lake	150	2
Skorpionen	150	2
ırudrang	150	2
rs	150	2
Teuns, (floating batteries)	30	1
Ialdur and Sköla	30	1
ts	30	1

Navies of the world—Continued.

	Horse-power, nom.	No. of guns.
GREECE.		
King George	400	4
Queen Olga	300	12
PORTUGUESE.		
Vasco de Gama	3,200	4
CHILI.		
Admiral Cochrane and Valparaiso		
JAPANESE.		
Stonewall and one other	500	
BRAZIL.		
Herval Silvado	200	4
Bahia	140	2
Colombo	240	8
Cabral	240	6
Rio Grande, (monitors) } Fleet of Uruguay	30	1
Alagôas, (monitors) } Fleet of Uruguay	30	1
Marize Barros } Fleet of Paraguay and Mato Grasso.	200	4
Barroso } Fleet of Paraguay and Mato Grasso.	130	6
Tarmandare } Fleet of Paraguay and Mato Grasso.	80	6
Pianhy, Ceara, and Para } Fleet of Paraguay and Mato Grasso.	30	1
Santa Cartharina } Fleet of Paraguay and Mato Grasso.	30	1
Brazil } Fleet of Rio da Parta	230	9
Lima Barros } Fleet of Rio da Parta	300	4
Sete de Setembro		
Independencia, (building.)		
Two monitors, (building in France.)		
PERUVIAN.		
Independencia	550	14
Huascar and Union	300	4
Manco Capac and Atahualpa	320	2
Loa and Victoria	200	2

RECAPITULATION.

IRON-CLADS AND FLOATING BATTERIES.

France	69
Great Britain	63
Russia	30
Italy	25
Turkey	25
Norway and Sweden	20
Brazil	19
Holland	18
[illegible]tria	14
[illegible]any	11

Spain	9
Denmark	9
Peru	7
Greece	2
Chili	2
Japan	2
Portugal	1
Total	226

NOTE.—The United States has fourteen small monitors in commission and ready for service.

TH CONGRESS, 1st Session. } HOUSE OF REPRESENTATIVES. { Ex. Doc. 1, Part 4.

REPORT

OF THE

POSTMASTER-GENERAL

OF THE

UNITED STATES;

BEING PART OF

THE MESSAGE AND DOCUMENTS

COMMUNICATED TO THE

TWO HOUSES OF CONGRESS

AT THE

BEGINNING OF THE FIRST SESSION OF THE FORTY-FOURTH CONGRESS.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1875.

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REPORT

OF

THE POSTMASTER-GENERAL.

POST-OFFICE DEPARTMENT,
Washington, D. C., November 15, 1875.

SIR: The ordinary receipts of this Department during the fiscal year ended June 30, 1875, were $26,671,218.50, an increase of $299,34480, or 1.13 per cent. over the receipts of 1874, being less than the estimate made in 1873 by $1,809,331.

To the ordinary receipts should be added the sum of $650,000, subsidies to steamship-lines, drawn from the general Treasury and expended, and $120,142.09, revenue from money-order business, making the receipts from all sources $27,441,360.57.

It is proper to state that the decrease on the estimate is accounted for in the general depression of business throughout the country, which affected postal affairs during the past year more than at any previous time, and also in the increase of the rate of postage on third-class matter, which has very materially reduced the amount of transient papers, books, &c., transmitted through the mails.

The expenditures of all kinds were $33,611,309.45, an increase of $1,484,894.87, or 4.62 per cent. over those for 1874, and less than the amount estimated in 1873 by $318,603.

Of these expenditures $1,338,319.50 were for special objects in previous years, provided for at the last session of Congress; consequently the legitimate expenditures for the past fiscal year were only $32,272,989.95, an increase over 1874 of $146,575.37, or 0.456 per cent., and less than the estimate made in 1873 by $1,656,922.50.

The amount drawn from the general Treasury and expended for subsidies to mail-steamship lines was $650,000, which amount is included in the expenditures under the head of "transportation."

The amount drawn from the general Treasury, under appropriations to meet deficiencies, was $6,054,646.96, from which should be deducted the sum of $1,338,319.50, referred to in a previous paragraph, which will leave, as the legitimate amount drawn on account of the past fiscal year, $4,716,327.4609, against $5,259,933.55 for the fiscal year of 1873–'74, a difference in favor of 1875 of $543,606.09.

Table No. 2, accompanying the report of the Third Assistant Postmaster-General, shows the receipts and expenditures by quarters, and also the increase or decrease in each item as compared with the fiscal years of 1873–'74 and 1872–'73.

The estimated expenditures for the fiscal year ending June 30, 1877, are		$36,
The ordinary revenues are estimated at 7 per cent. over the past fiscal year, making	$28,538,203 80	
Estimated revenue from money-order business	120,000 00	
Total estimated revenue for the fiscal year ending June 30, 1877.		28,
Excess of expenditures to be appropriated out of the general Treasury, as a deficiency		8,

The foregoing estimates to not include the following special ations, to be made out of the general Treasury:

For official postage-stamps and stamped envelopes for use of the Post-Office Department during the year	$
For mail-steamship service between San Francisco, Japan and China, under acts approved February 17, 1865, and February 18, 1867	

Of the appropriations for deficiencies, there were unexpended 30, 1874, the following amounts:

For fiscal year ended June 30, 1871	
For fiscal year ended June 30, 1872	
For fiscal year ended June 30, 1873	1,
For fiscal year ended June 30, 1874	3,
	4,
Amount appropriated for fiscal year of 1874–'75	5,
Total	10,

During the past fiscal year there has been drawn on account of payments for previous fiscal years as follows:

Fiscal year of 1870–'71	$14,853 62	
Fiscal year of 1871–'72	22,106 02	
Fiscal year of 1872–'73	1,085,942 33	
Fiscal year of 1873–'74	2,039,314 33	
Fiscal year of 1874–'75	4,400,000 00	
A total of		7,
Amount of deficiency appropriations undrawn and available for payments of indebtedness to June 30, 1875		2,

Against the above sum there are chargeable the following unsettled accounts, estimated:

Balances due foreign countries	$93,815 47	
Mail-service under contract or recognized, not yet reported for payment	672,755 14	
Mail-service unrecognized	762,489 79	
Total		1,
Leaving, after settlement of all liabilities to June 30, 1875, a net balance on deficiency appropriations of		1,

Of the amount drawn during the past year from appropri cal year of 1872–'73, $1,000,000 was for additional compen

railroads, under a re-adjustment of pay for transportation of the mails, (see sec. 2, Statutes at Large, vol. 18, p. 414,) and of the amount drawn from appropriation for 1873–'74, $300,000 was for adjustment of postmasters' salaries prior to June 30, 1874. (See sec. 3, Statutes at Large, vol. 18, p. 414.)

The number of ordinary postage-stamps issued during the past fiscal year was 682,342,470, valued at	$18,271,479 00
Newspaper and periodical stamps, 2,209,215	815,902 47
Stamped envelopes, plain, 72,285,150	2,046,111 35
Stamped envelopes, request, 54,631,000	1,791,686 25
Newspaper-wrappers, 22,850,250	286,679 74
Postal cards, 107,616,000	1,076,160 00
Official postage-stamps, 18,495,940	834,970 25
Official stamped envelopes and wrappers, 12,845,000	354,522 18
Aggregating 973,275,025	25,477,511 24

The following table shows the increase in stamps of all kinds, stamped envelopes, newspaper-wrappers, and postal cards over the previous year:

Description.	Fiscal year ended June 30, 1875.	Fiscal year ended June 30, 1874.	Increase.	
			Value.	Per cent.
Ordinary postage-stamps	$18,271,479 00	$17,275,242 00	$996,237 00	5.76
Stamped envelopes, plain	2,046,111 35	1,927,952 30	118,159 05	6.12
Stamped envelopes, request	1,791,686 25	1,733,738 40	57,947 85	3.34
Newspaper-wrappers	286,679 74	220,502 06	66,177 68	30.01
Postal cards	1,076,160 00	910,790 00	165,370 00	18.15
Total			1,403,891 58	
Official postage-stamps and stamped envelopes and wrappers	1,189,492 43	1,769,301 86		
Deduct for decrease in last item			579,809 43	40.62
			824,082 15	
Add newspaper and periodical stamps	815,902 47		815,902 47	
Aggregate	25,477,511 24	23,837,526 62	1,639,984 62	6.87

During the past fiscal year the Department has suffered the loss of only ten packages of stamps, stamped envelopes, and postal cards, of the value of $256.30.

DEAD-LETTERS.

The operations of the Dead-Letter Division of the Third Assistant Postmaster-General's Office are fully shown by the tabular statements appended to that officer's report, which are briefly summarized as follows:

The total number of letters of all kinds received during the year was 3,628,808, an average of 11,878 for each working-day, of which 31,779 contained $61,769.14 in current funds; 14,225 contained commercial paper to the nominal value of $2,997,847.53; 135,027 contained jewelry

of merchandise, photographs, postage and revenue stam
, bills of lading, and souvenirs of great variety; 214,119 we
letters, which, under the provision of the postal conventions, we
ed to the countries of origin unopened; and 3,233,668 contain
g of value, which, with the 534,339 letters of all kinds on hand
1, 1874, make the total number of letters disposed of during the
4,163,147.

ese letters are also classified, without regard to their contents, as
ws: Ordinary mail-letters, 2,416,112; local or drop, 488,600; re
ned from foreign countries, 106,237; returned from hotels, 31,240;
d for postage, 318,604; misdirected, 61,252; without address, 5,963;
ip, 2,412; registered, 5,857; foreign, 210,377; and 516,493 of ordina
ail and drop letters on hand from last fiscal year.

A table has also been prepared showing the number, contents, an
disposition of all the registered letters not delivered, and received at th
Dead-Letter Office during the year, from which it appears that of th
5,942 letters (including 85 on hand July 1, 1874) received, 5,556 were
delivered to the proper owners.

During the year, 5,428 applications for supposed lost letters were re-
ceived, and in 1,950 cases the letters inquired for were found and deliv-
ered.

The amount taken from unclaimed letters during the year and depos-
ited in the Treasury to the credit of this Department was $11,080.

REGISTERED LETTERS.

The only available means for estimating the growth of the registered-
letter system is found in the issues of registered-package envelopes to
postmasters, as from want of sufficient clerical force the reports of the
number of letters registered at the various post-offices in the country
have not been classified and recorded.

It appears that 2,922,000 envelopes were issued during the year
ended June 30, 1874, while during the last fiscal year, 3,379,900 we
issued, an increase of over 15 per cent., which probably represents th
growth of the system.

To this Department, in the transmission of packages of postage-
stamps, stamped envelopes, postal cards, and other supplies for post-
masters, the system is invaluable, as out of a total number of 359,462
registered packages transmitted during the year, the value of which was
$25,477,511.24, only ten packages of stamps, to the value of $256.30,
were lost, and some of these it is presumed were destroyed by fire.

The fee for registering letters has been made uniform at ten cents for
all parts of the world.

A system for the exchange of through-pouches, prepared exclu
registered matter, has been inaugurated, and is now in su
the routes between Boston and New Orleans, a

The law regulating the registration of letters should be amended, in rder that the system may be simplified, and at the same time rendered ıore efficient, and such suggestions as will tend to accomplish these esults will at the proper time be submitted to Congress.

CONTRACTS.

There were in the service of the Department on the 30th of June, 875, 6,280 contractors for the transportation of the mails on public outes.

There were at the close of the year, 2,170 "special" offices, each with mail-carrier whose pay from the Department is not allowed to exceed he net postal yield of the office.

Of public mail-routes in operation there were 8,283, (of which 871 ere railroad; being an increase of 47 routes of this class over the preious year,) aggregating in length 277,873 miles; in annual transportaion, 133,822,216 miles; in annual cost, $15,353,369. Adding the comensation of railway-post-office clerks, route-agents, mail-route messeners, local agents, and mail-messengers, amounting to $2,931,801, the ggregate annual cost will be $18,285,170.

The service was divided as follows:

Railroad-routes: Length, 70,083 miles; annual transportation, 75,-54,910 miles; annual cost, $9,216,518—about 12.26 cents per mile.

Steamboat-routes: Length, 15,788 miles; annual transportation, ,958,852 miles; annual cost, $684,130—about 17.28 cents per mile.

Other routes upon which the mails are required to be conveyed with celerity, certainty, and security:" Length, 192,002 miles; annual ransportation, 54,708,454 miles; annual cost, $5,452,721—about 9.97 ents per mile.

There was an increase over the preceding year in length of routes of ,776 miles; in annual transportation, of 5,194,740 miles; and a decrease in cost of $48,688. Adding the increased cost for railway-post-office clerks, route, local, and other agents, $149,899, the total increase in cost was $101,211.

The railroad-routes have been increased in length 2,349 miles, and in cost $626,855, against an increase last year of 4,277 miles in length, and $1,332,467 in cost.

RE-ADJUSTMENT OF PAY ON RAILROAD-ROUTES.

The re-adjustment, under the act of March 3, 1873, of the rates of pay for mail-service on railroad-routes, from which the necessary returns had not come to hand when the tables (E and F) for the last annual report were prepared, and also on routes in States in which a new contract term commenced July 1, 1875, together with the adustment of the rates on certain new routes, is shown in Table F, ıerewith, made up for the year ending September 30, 1875. The

new routes adjusted number 72. The re-adjustment includes 23[illegible] routes, or parts thereof, of which the rates were increased on 182 an[illegible] decreased on 53, the net result being an increase of $408,691.16 in th[illegible] amount of annual pay. Adding this sum to the $1,254,327.46 increas[illegible] by re-adjustment the preceding year, the aggregate increase of pa[illegible] in the two years under the act of March 3, 1873, is $1,663,018.62. Th[illegible] act appropriated half a million of dollars specifically for the increase [illegible] pay for which it provided. It is to be observed, however, that, f[illegible] several years prior to the passage of that act, the regular appropriatio[illegible] for "inland transportation" included an allowance for the increase of [illegible] pense by re-adjustment of pay on railroad-routes, caused by the natu[illegible] growth in the bulk of the mails, and the necessary improvements of [illegible] accommodations for their distribution while in transit. As remark[illegible] in the last annual report, this natural increase in 1872 amounted [illegible] $354,865.94, and if the re-adjustment of pay on routes in the N[illegible] York and New England section for the contract term commenc[illegible] July 1, 1873, had not been postponed to await the receipt of [illegible] new returns required by that act, the natural increase would h[illegible] amounted in 1873, at the percentage of increase of the regular app[illegible] priation for "inland transportation" for that year over the cost for [illegible] preceding year, to $385,029.54, and in 1874 to $419,040.48. The natu[illegible] increase for 1875, at six and nine-tenths per cent. advance on that [illegible] 1874—the rate of increase of the appropriation for "inland transpo[illegible] tation" for that year over the preceding—would have been $447,954.27. The natural increase for the three years would thus have amounted [illegible] $1,252,024.29. The actual increase is $1,886,842.17, an excess of $634,817.88, which is only $134,817.88 more than the half million which Congress specifically appropriated for the purpose by the act of March 3, 1873. In the estimate made last year of the probable effect of the passage of the act, from which it appeared that the whole excess of cost over the appropriations would amount to $679,308.52, there was an omission to note the difference of $161,205.99 between the natural increase for 1873, namely, $385,029.54, and the actual increase for that year, namely, $223,823.55, this difference resulting from the aforementioned postponement of the re-adjustment of the rates on railroad-routes in the New York and New England section which would have been made that year if the act had not been passed. In that estimate also an allowance of $344,021.54 was made to cover the re-adjustment on routes from which the necessary returns had not then been received. This was based on the supposition that the rate of increase on the routes remaining to be heard from would be the same as on those already re-adjusted. It is apparent, however, from the returns since received from a large portion of those routes, that, in the average, they diminish instead of increasing the rates of compensation. Thus, whereas the natural increase for 1875, as above estimated, would be $447,954.27, the actual increase is only $408,691.16, a diminution of

),263.11. Deducting this sum, together with the $161,205.99 omitted, l the $344,021.54 for further re-adjustment now shown to have been necessarily allowed in the estimate last year, amounting in all to 4,490.64, from the $679,308.52 excess shown by that estimate, there ains only the $134,817.88 above found as an actual excess thus far r the regular appropriations and the specific appropriation of half a lion made by the act of March 3, 1873, excluding entirely "the unpended balance of the amount appropriated for deficiencies in the enues of the postal service for the fiscal year ending June thirtieth, 73," authorized to be used for this purpose by act of March 3, 1875. d as on the small number of routes still remaining to be heard from e re-adjustment, when made, will probably diminish the aggregate mpensation, even this small excess is liable to still further reduction.

POST-ROUTE MAPS.

During the year new maps have been prepared and published of the tates of Virginia and West Virginia, North Carolina and South Carona, Alabama and Mississippi, Louisiana and Texas, Nebraska and olorado. Some of these maps are, however, to be regarded as preliminary until more reliable and systematic surveys are made, to constitute basis for correct compilation. New editions of the various maps preiously issued, embracing all the Northern and Middle States, (except linnesota,) have also been published for use by postmasters and special gents, and to supply the increasing requirements of the railway mailervice for maps to secure the proper distribution of the mails. Postute maps are in course of preparation of the States of Minnesota, eorgia, Florida, Arkansas and the Indian Territory, Kentucky and ennessee, Kansas, and of some of the Territories.

FINES AND DEDUCTIONS.

The amount of fines imposed upon contractors and deductions made om their pay for failures and other delinquencies for the year was 110,809.36, and the amount remitted during the same period was 11,032.31, leaving the net amount of fines and deductions $99,777.05.

MAIL BAGS, LOCKS, AND KEYS.

A table appended to this report exhibits, in detail, the number, deiption, and cost of mail-bags and mail-catchers, and of mail locks and eys, purchased under contracts, during the fiscal year last ended. The tal number of mail-bags purchased and put into service amounted to),050; of which 67,500 were for the transmission of printed or second nd third class matter, and 12,550 for letters, or first-class matter; the hole, with purchases of mail-catchers and mail-bag labels, costing 107,996.83; or $16,906.92 less than was expended the preceding year or like objects.

The table referred to shows the cost of new mail-bags, but do not include the repairs of old mail-bags and some other items of e pense incident to the use of mail-bags; all of which, however, a included in the total expenditure under the head of mail-bags, as e hibited in the annexed report of the Auditor.

The total cost of new mail locks and keys, including a supply of n locks and keys for all the street letter-boxes connected with the fr delivery system, amounted to $31,840.

MAIL DEPREDATIONS.

The number of recorded complaints during the past year of miss ing letters of value is 5,645, of which 2,677 were registered and 2,968 unregistered. The registered letters contained, as is alleged, currency, bonds, drafts, &c., amounting to $76,216.24, and the unregistered, valuable contents amounting to $75,997.16. Of the 2,677 registered letters reported as lost, 1,083 were satisfactorily accounted for, 911 actually lost, and 683 remain under investigation.

During the year, 307 persons were arrested, charged with variou s violations of the postal laws, the greater portion of whom were n t connected with the postal service. The employés of the Departmen t thus arrested were classified as follows: Postmasters, 41; assistan t postmasters, 15; post-office clerks, 23; route-agents, 4; local agent , 3; mail-carriers, 16; mail-messengers, 2; letter-carriers, 11; other , 192. Of those persons arrested who were not in the employ of the D partment, the majority were tramps and vagabonds, and burglars of the lower order of intelligence. The following disposition was made of these cases: convicted, 107; acquitted, 9; prosecution abandoned, 5; *nolle prosequi* entered, 9; not indicted, 4; escaped, 4; forfeited bail, 1; died before trial, 2; dismissed, 9; awaiting trial, 157.

RAILWAY POST-OFFICES.

A tabular statement hereto appended shows that the number of railway post-office lines in operation on the 30th of June, 1875, was 62, extending over 16,932 miles of railroad routes; a decrease of 1 line, and an increase of 518 miles over the preceding year. The number of clerks employed was 901, at an annual cost of $1,122,640; an increase of 51 clerks, and $64,440. Upon 13,810 miles the service is performed daily, and upon 3,122 miles twice daily, equivalent, in all, to 20,054 miles each way daily. Counting all the lines both ways, the aggregate service is 40,109 miles daily.

FOREIGN MAILS.

The total number of letters exchanged during the year with foreign countries was 25,135,581; a decrease of 3,443,264 from the numbe reported for 1874. Of this number, 12,854,333, were sent from, a 12,281,248 were received in, the United States. This large decrease w

in part, owing to the fact that no account was taken of the letters exchanged with Canada under the new arrangement with that country during the last half of the fiscal year.

The number of letters (single rates) exchanged in the United States and European mails was 18,952,537; a decrease of 1,014,505 from the number reported for 1874.

The total postage on the letters exchanged with foreign countries amounted to $1,713,766.90; a decrease of $341,036.91 from the amount reported for 1874.

The aggregate amount of postage (sea, inland, and foreign) on the letter-mails exchanged with the United Kingdom of Great Britain and Ireland, Germany, France, Belgium, The Netherlands, Switzerland, Italy, Denmark, Sweden and Norway, was $1,383,329.69; a decrease of $55,470.96 from the amount reported for 1874. The postages on letters sent exceeded the postages on letters received from the same countries in the sum of $14,036.15 being 1 per cent. of the aggregate amount. The postage collected in the United States amounted to $783,364.79, and in Europe to $599,964.90; the excess of collections in the United States being $183,399.89, or 13¼ per cent. of the entire postage-receipts on European correspondence.

Comparing the year 1875 with the year 1874, the rate of decrease in the total number of letters exchanged with foreign countries was 12 per cent., and the rate of decrease in the amount of postages thereon was 16½ per cent. The decrease in the number of letters exchanged with European countries was 5$\frac{1}{12}$ per cent., and the decrease of postages thereon amounted to ⅜ per cent.

The total weight of mails exchanged during the year with European countries was 1,904,493 pounds, (over 952 tons;) a decrease of 30,810 pounds, (or 15 tons,) compared with the previous year. The weight of letter correspondence was 386,540 pounds, and of printed matter and samples 1,517,953 pounds. The aggregate weight of mails sent to Europe was 902,429½ pounds, and of mails received from Europe, 1,002,063½ pounds. The weight of letter-correspondence sent to Europe 201,940 pounds, and of letter-correspondence received from Europe 184,600 pounds. The weight of printed matter and samples sent to Europe was 700,489 pounds, and of printed matter and samples received from Europe, 817,464 pounds.

The cost of the United States transatlantic mail-steamship service for the year 1875 was $228,098.25; being a decrease of $7,285.56 from the cost of the same service for the year 1874. The payments made to the respective steamship-lines carrying mails to Europe, receiving the sea-postages as full compensation for the service, were as follows:

The Hamburg American Packet Company, for 50 trips from New York to Plymouth, Cherbourg, and Hamburg	$46,486 86
The North German Lloyd, of Bremen, for 69 trips from New York to Southampton and Bremen, and 20 trips from Baltimore to Bremen	39,993 00

The Inman line, for 17 trips from New York to Queenstown	11,368
The White Star line, for 36 trips from New York to Queenstown	27,029
The Liverpool and Great Western, (Williams & Guion line,) for 28 trips from New York to Queenstown	20,833
The Cunard line, for 52 trips from New York to Queenstown and Liverpool, and 44 trips from Boston to Queenstown and Liverpool	52,317
The Eagle line, for 21 trips from New York to Plymouth, Cherbourg, and Hamburg	18,402 65
The Canadian line, for 53 trips to Liverpool	4,876 68
The Red-Star line, for 14 trips from Philadelphia to Belgium	42 51
American Steamship Company, for 49 trips from Philadelphia to Queenstown	2,315 74
The Netherlands Steam Navigation Company, for 4 trips from New York to Rotterdam	86 86
The Anchor line, for 13 trips from New York to Glasgow	794 35
The General Transatlantic Steamship Company, for 26 trips from New York to France	1,924 68
The National line, for 1 trip from New York to England and 1 trip from Boston to England	154 88
The Snow & Burgess line, for 1 trip from New York to England	1,386 31
The Thayer & Lincoln line, for 1 trip from Boston to England	84 74
Total	228,098 25

The United States postages on mails conveyed to and from the West Indies, Panama, Central America, Brazil, Mexico, Bermuda, Nova Scotia, New Granada, Venezuela, and Ecuador, amounted to $154,650.78, and the cost of the sea-conveyance thereof was $96,971.11. The United States postages on mails exchanged with Brazil, Japan and China, the Sandwich Islands, New Zealand, and Australia, by means of the subsidized lines of direct mail-steamers, amounted to $56,049.77. The total cost of the United States ocean-mail-steamship service for the year 1875 (including $650,000 paid from special appropriation for steamship service to Japan and China and to Brazil) was $986,536.66.

Arrangements have been made with the owners of the Occidental and Oriental line of steamers, (an English line,) plying monthly between San Francisco, Yokohama, and Hong Kong, for the conveyance of the mails to Japan and China at the sea-postages as compensation for the service. This, in connection with the subsidized monthly service of the Pacific Mail Steamship Company, secures a regular semi-monthly transportation of the mails to Japan and China.

The contract with the United States and Brazil Mail-Steamship Company, authorized by act of Congress approved May 28, 1864, for the conveyance of a monthly mail from New York to Rio de Janeiro, Brazil, for a term of ten years, at an annual compensation of $150,000, expired by limitation on the 30th of September, 1875, and the company has withdrawn its steamers from that route.

Arrangements have been made for the conveyance of mails to Brazil by the King line of British steamers, recently organized for a monthly service between Baltimore and Rio de Janeiro, allowing as compensation for the service the sea-postage on the mails conveyed, but, the regular

ng for October having been omitted, it is not known whether this ice, the only existing one to Brazil, will be regularly maintained.

ı the absence of a direct mail-service to Brazil, all correspondence that country and adjacent South American States has to take the ıitous route via England, and thence by British mail-packets to Rio Janeiro, thus involving very serious delays. The maintenance of or more lines of direct mail-steamship communication with Brazil is : important to our postal and commercial interests. While there ts at present no regular line of mail-steamers plying between this ıtry and Brazil, I am credibly informed there are as many as ten s of direct steamers—English, German, and French—plying regularly ween European and South American ports.

ı the last annual report, reference was made to the International tal Congress which assembled at Berne, Switzerland, on the 15th of tember, 1874, and to the fact that a postal convention had been eed upon and signed by the delegates from all the countries repre-ted in that congress, with the exception of France.

. treaty concerning the formation of a General Postal Union, a copy which is annexed, was signed at Berne on the 9th of October, 1874, he delegates from the United States, Germany, Austria, Hungary, gium, Denmark, Egypt, Spain, Great Britain, Greece, Italy, Luxem-g, Norway, the Netherlands, Portugal, Roumania, Russia, Servia, tzerland, Sweden, and Turkey. It was subsequently duly approved ratified by the governments of each of these countries, and the acts atification were exchanged at Berne on the 3d of May, 1875, on which France gave its adhesion to the treaty, on certain conditions and ırvations assented to by the other governments, the principal of ch was that the treaty should not enter into effect, so far as France concerned, until the 1st of January, 1876. As to all the other coun-s, it was carried into operation on the 1st of July, 1875. The inter-ıge of correspondence between the countries comprising the general al union has been greatly simplified by the uniformity of postage-s and of other conditions of exchange established throughout the tal Union territory. This territory comprises the United States of erica, the whole of Europe, Asiatic Turkey, Asiatic Russia, and pt, including also Iceland and the Faroe Islands as part of Denmark, Balearic Isles, the Canaries, the Spanish possessions on the north-coast of Africa and the Spanish postal establishments on the west-coast of Morocco as making part of Spain, Algeria as making part rance, the Island of Malta as part of the postal administration of at Britain, and Madeira and the Azores as making part of Portugal. he general union rate for letters is fixed at 25 centimes (French) or ıearest equivalent in the money of each country on each prepaid er not exceeding 15 grams in weight, and for letters exceeding weight an additional rate is charged for every 15 grams or frac-of 15 grams. The postage on unpaid letters is double that lev-

ied in the country of destination on prepaid letters. The postage post-cards is fixed at one half of that on paid letters, prepayment compulsory. The prepaid postage on printed matter of all kinds and patterns of merchandise is fixed at 7 centimes (French) for each single packet not exceeding the weight of 50 grams, the option being reserved to each country, as a measure of conversion, in order to suit its monetary requirements, of levying a rate higher or lower than 7 centimes, provided it does not exceed 11 centimes or go below 5 centimes. Each country retains all the postage it collects on the postal union correspondence of every kind, both on the prepaid sent or the unpaid received, thus dispensing with all accounts between the several post departments of the union upon the international correspondence exchanged between them.

The other provisions of the treaty simplify the details and unify the conditions of postal intercourse. Uniform transit rates at reduced charges, for the conveyance of closed mails by land and sea, are established within the territory of the union, but these rates are not applied to the Indian mails or to the mails conveyed across the Territory of the United States by the railways between New York and San Francisco, which, on account of the exceptional character of the services, are excepted to form the object of special arrangements between the post departments concerned. Those countries of the postal union which have not adopted the decimal metrical system of weight are allowed to substitute for the rating of postage half an ounce avoirdupois for 15 grams, and two ounces for 50 grams, and are also authorized to raise the limit of weight for a single newspaper to 4 ounces, thus permitting our metropolitan papers, which exceed the postal union limit of 50 grams, to pass in the mails throughout the postal union at a single postage charge.

Provision was also made for the organization of a central office of the general postal union, under the supervision of the post department of Switzerland, the expenses of which will be borne by all the offices of the contracting states. This office is charged with the duty of collecting, publishing, and distributing information of every kind which concerns the international postal service; of giving, at the request of parties concerned, an opinion upon questions in dispute; of making known proposals for modifying the detailed regulations; of notifying alterations adopted; of facilitating operations relating to international accounts, and, in general, of considering and working out all questions in the interests of the postal union.

The uniform rates of postage levied and collected in the United States on correspondence for or from the countries comprising the General Postal Union are as follows:

For prepaid letters, 5 cents per 15 grams, (½ oz.)

For unpaid letters received, 10 cents for 15 grams, (½ oz.)

For postal cards, 2 cents each.

For newspapers, if not over four ounces in weight, 2 cents each.
For books and other printed matter, patterns, &c., 2 cents per each ight of two ounces or fraction of two ounces.
For the registration-fee on all correspondence, 10 cents.
The general postal union treaty substitutes a single postage for the merous and complex rates previously charged under the separate nventions with foreign countries, and organizes in a simple and unirm manner the postal relations between twenty-three countries, comising a vast majority of the civilized nations of the world. It prodes for the entry into the union of countries not yet forming part of , and the period is not distant when a cheap and uniform postage, with tal abolition of international postage accounts, will obtain universal pplication in all countries of the world in which the postal service is gularly organized. Such a unification of the conditions of postal inercourse throughout the world must prove a most efficient means of lvancing the general prosperity and of promoting the peace and aternity of nations.

I deemed it important, for the sake of uniformity, to apply the general ostal union rate of postage, as far as practicable, to the correspondence ent to or received from other countries, and accordingly an order was ade on the 13th of May, 1875, under the authority given by section 35 of the act approved June 8, 1872, reducing, from July 1, 1875, the ngle rate of United States postage from 10 to 5 cents on letters sent or received from foreign countries with which different rates had not een established by postal convention or other arrangement. This reuction applied chiefly to correspondence sent to or received from the Vest Indies, Central America, and countries of the west coast of South merica, and has effected an aggregate yearly saving to correspondents this country of not less than $50,000. It is also my purpose to adopt, s far as practicable, the general postal union letter rate in all future eparate postal conventions or arrangements with foreign countries.

A new postal arrangement has been concluded with the Dominion of anada, for the unification of the postal systems of the two countries. his arrangement, a copy of which is appended, was carried into full peration on the 1st of February, 1875. Under its provisions frontierines are disregarded, and the postal services performed on each side eated as one entire service, so that correspondence of every kind preaid at the domestic rates of the country of origin is received, forwarded, nd delivered in the country of destination free of postage. No acounts are kept on the international correspondence, each post-departent retaining all the postage it collects on mail-matter of every kind nt to the other for delivery. This simple arrangement reduces poste-charges to the domestic rates of the country of origin, disregards fron r lines, so far as the postal service is concerned, and brings our people o closer social and business relations with their Canada neighbors.

An agreement has been concluded with the Empire of Japan, modify-

ing the provisions of the postal convention with that country, by providing for the full prepayment to destination of the postage on printed matter of all kinds, patterns, and samples of merchandise. This agreement, a copy of which is appended, went into operation on the 1st of July, 1875.

An amended article to replace article 3 of the postal convention between the United States and the colonial government of New South Wales has been executed by the respective post-departments, a copy of which is annexed. This amended article provides for the full prepayment of printed matter, &c., to destination in either country.

Negotiations are in progress for the conclusion of a postal convention with the colonial government of Queensland on the basis of the existing convention with New South Wales, and also for a postal convention with the republic of Chili, based on the postal principles adopted in the General Postal Union Treaty of Berne.

Propositions are also pending for a postal convention with the governments of Peru and of Bermuda.

This Department is also in correspondence with the British post-office in relation to an increase of the United States territorial transit rates on the British closed mails transported by rail between New York and San Francisco. These closed mails are of great bulk and weight averaging several tons by each dispatch, and the rates of transit paid by Great Britain under the postal convention of November, 1868, are wholly insufficient to defray the actual cost of their transportation by rail across our continent a distance of over three thousand three hundred miles. This Department, as a plain business proposition, takes the ground that if it transports mails for other countries over this long and exceptionally expensive route, we should require, to the extent that they do not perform an equivalent service, that they should pay the bills.

APPOINTMENTS.

The report of the appointment-office shows the following:

Number of post-offices established during the year	2,313
Number discontinued	1,060
Increase	1,253
Number in operation June 30, 1874	34,294
Number in operation June 30, 1875	35,547
Number filled by appointments of the President	1,547
Number filled by appointments of the Postmaster-General	34,000
Appointments were made during the year—	
On resignations	6,017
On removals	974
On changes of names and sites	187
On deaths of postmasters	380
On establishment of new post-offices	2,313
Total appointments	9,871
Number of cases acted on during the year	11,175

ımber and aggregate compensation of special agents, route-nail-route messengers, railway post-office clerks, and local service during the year ended June 30, 1875, were—

ıl agents *	$160,923 49
ay post-office clerks	1,122,840 00
-agents	943,800 00
route messengers	147,470 00
agents	96,580 00
Total	2,471,413 49

lowing table shows the number of employés in the Post-Office ɜnt; also the number of postmasters, contractors, clerks in ɜs, route-agents, railway post-office clerks, and other officers ı on June 30, 1874, and June 30, 1875, respectively:

DEPARTMENTAL OFFICERS AND EMPLOYÉS.	1874.	1875.
eneral	1	1
stmaster's-General	3	3
nt of Foreign Mails	1	1
nt of Money-Order System	1	1
o the Postmaster-General	1	1
sion of Dead-Letters	1	1
sion of Depredations	1	1
sion of Postage-stamps, Stamped Envelopes, and Postal Cards	.....	1
for the Department	1	1
of Bureaus	5	5
ficer and superintendent of building	1	1
ıra, watchmen, &c	348	367
	364	384
OTHER OFFICERS AND AGENTS.		
	34,294	35,547
	6,232	6,280
t-offices	4,228	4,467
s	2,049	2,195
	936	987
office clerks	850	901
ɜssengers	211	225
	124	125
s	76	66
ı service	49,364	51,177

itions have been made during the year to the number of free-offices. The service was, however, extended in five large cities tinuing the smaller offices in and adjacent to them, substitut-h offices, and extending the carriers' delivery, in accordance policy announced in my last report.

ıeral results of the service show a most gratifying exhibit, and dicate its usefulness and popularity. For the first time since ishment the aggregate postage on local matter exceeded the

* Other special agents charged to separate appropriations.

total expense. For the fiscal year ended June 30, 1874, the deficiency of local postage to meet the expenses was $191,214.75. This year the excess of postage over the expense was $67,517.55. The increase in the cost of service was 4 per cent. The increase in the postage on local matter was 21 per cent.

The aggregate results were as follows:

		Increase over preceding year.
Number of offices	87	.....
Number of letter-carriers	2, 195	146
Mail-letters delivered	179, 083, 468	13, 063, 698
Mail postal cards delivered	18, 313, 565	7, 312, 756
Local letters delivered	48, 839, 237	3, 659, 942
Local postal cards delivered	16, 026, 212	7, 068, 106
Newspapers delivered	68, 454, 476	11, 965, 894
Letters collected	187, 950, 641	10, 052, 167
Postal cards collected	28, 203, 468	11, 905, 143
Newspapers collected	27, 330, 407	5, 767, 971
Whole number of pieces handled	574, 201, 474	70, 815, 077
Pieces handled per carrier	261, 595	15, 921
Total cost of service	$1, 880, 041. 99	$77, 345. 58 (or 4 per cent.)
Average cost per piece in mills *	3. 26	.....
Average cost per carrier *	$853. 95	.....
Amount of postage on local matter	$1, 947, 559. 54	$336, 077. 88 (or 21 per ct.)
Excess of postage on local matter over total cost of service	$67, 517. 55	.....

* Based on the aggregate ($1,874,411.71) paid carriers, including incidental expenses at the several offices.

On taking charge of the Department I found too great an inequality in the salaries paid to carriers. The division of the free-delivery offices into two classes, on the basis of population—the first comprising cities having at least 100,000 inhabitants, and the second cities having a less population—was retained as a fair classification.

The annual salary of carriers entering the service at offices of the first-class was fixed at not exceeding $700, and at offices of the second-class at not exceeding $600; and an increase authorized, on certificate of postmaster to the faithfulness and efficiency of carriers, of $100 a year in each class, until the maximum of $900 in the first, and of $800 in the second, is reached.

This adjustment of salaries is believed to be as fair and satisfactory as the varied circumstances of so extended a service will admit.

A tabular statement of the operations of the service at each office will be found in the Appendix.

POSTAL MONEY-ORDER SYSTEM.

The whole number of money-order offices in operation at the close of the fiscal year ended June 30, 1874, was 3,069. During the year ended

June 30, 1875, 346 new offices were established and 14 discontinued, making the number in operation during the entire year 3,401. Five offices were discontinued, to take effect June 30, 1875. On the 5th of July following, 299 new money-order offices were put in operation, and on the 1st of October one of the five offices discontinued at the close of the fiscal year was re-established; making the present number of money-order offices 3,696. Of the additional offices established since July 1, 1875, one was a station of the Boston office.

The number of domestic money-orders issued during the last year was 5,006,323, the aggregate value of which was $77,431,251.58. The number of such orders paid was 4,952,747, amounting in value to $76,865,353.75; to which is to be added the amount of orders repaid to the remitters, $496,337. Total of payments, $77,361,690.75; excess of issues over payments, $69,560.83.

The total amount of fees received by postmasters for the issue of domestic money-orders was $493,011.44.

The business of the year as given above shows a gain of $3,006,396.87, or 4.04 per cent., in the amount of orders issued; a gain of $3,151,534.50, or 4.24 per cent., in the amount of orders paid; and a gain of $31,629.14, or 6.85 per cent., in the amount of fees received, over the like transaction of the preceding year. The ratio of increase is much less than that for the year ended June 30, 1874. It is believed that this lessened rate of increase is mainly attributable to the financial depression, felt more or less during the entire year by all branches of industry throughout the country, and which has affected the increase of the money-order system very largely in the direction of its employment for business purposes. This is indicated by the average amount for which orders have been issued during the year, which is $15.46, being less by $1.36 than the average for the previous year.

There were 20,690 duplicate money-orders issued during the year. Of these, 19,713 were issued in lieu of orders which had been lost in the mails or which had failed to reach the payee in due time by reason of imperfect or erroneous address; 677 were issued in lieu of orders alleged to have been lost by the remitters or payees; 43 were issued to the remitters of orders, payment of which had been stopped under the authority of section 3929 of the Revised Statutes of the United States, because drawn in favor of conductors of fraudulent lotteries or gift enterprises; 289 were in lieu of orders rendered invalid because not presented for payment until more than one year after the date of issue; 10 were in lieu of orders made invalid by reason of having received more than one indorsement. The number of duplicates issued during the year was 3,711 greater than the number issued during the previous year.

The revenue-account of the domestic money-order system, as adjusted and reported by the Auditor, is as follows:

RECEIPTS.

Fees for money-orders issued		$493,011 44
For premiums on drafts		1,705 83
Total		494,717 27

EXPENDITURES.

Commission to postmasters and allowances for clerk-hire	$354,655 77	
Allowances to postmasters for remittances lost in transmission by mail	399 00	
Incidental expenses	19,520 41	
Total		374,575 18
Excess of receipts over expenditures		120,142 09

This amount of revenue is greater by $14,943.97 than that for the fiscal year ended June 30, 1874; being an increase of 14.2 per cent.

Under existing law, post-office blanks of every description are furnished exclusively by the Congressional Printer, hence the cost of money-order blanks used by the postmasters is not included in the foregoing statement of expenditures, nor does it embrace the expense of Department clerk-hire and stationery for money-order service, which are paid out of regular appropriations.

By the act of March 3, 1875, the schedule of fees for the issue of domestic money-orders was increased, to take effect July 1, 1875, in accordance with the recommendation contained in the last annual report. Before that time, the fees for the issue of money-orders were as follows, to wit: For an order not exceeding $10, five cents; over $10 and not exceeding $20, ten cents; over $20 and not exceeding $30, fifteen cents; over $30 and not exceeding $40, twenty cents; and over $40, twenty-five cents; but by the act above mentioned the fee for any order not exceeding $15 was fixed at ten cents, and over $15 and not exceeding $30, at fifteen cents. The fees for orders of larger amounts remain unchanged.

It is believed that this increase in the fees for money-orders will yield, during the current fiscal year, a gross revenue equal to the entire amount of expenditures of all kinds incurred on account of the money-order system, including the cost of Department clerical labor and of printing, blanks, &c.

The money-order funds that accumulate at offices which issue orders to a greater amount than they pay are transmitted to certain of the larger offices designated as depositories. When the postmaster is unable to obtain national-bank drafts for the purpose, the funds are forwarded by mail in registered packages. During the year the sum of $54,642,575 of surplus funds has been transmitted through the mails. Seventy cases of remittances, amounting to $12,066.61, reported as having been lost, were under investigation during the year, twenty-two of which, amounting to $4,155, were pending at the close of the previous

ar, and two, amounting to $153, were cases of loss during that year, t were not brought to the notice of the Department until after the blication of the last annual report; making the reported losses of the cal year $7,756.61; being $1,255.91 greater than those of the preced- ; year. In eight cases, amounting to $399, credit was allowed the stmasters by whom the remittances had been made; in five cases, ıounting to $1,090, the remitting postmasters had been required to ıke good the sums claimed to have been forwarded by them; in six- ·n cases, the amount, $2,702, was recovered by special agents; and ·ty-one cases, amounting to $7,875.61, are still pending.

The amount of orders drawn upon certain offices is greater than the ıount received by them from the issue of orders. To enable such ices to make prompt payments they are allowed credits, to a designated ıount in each case, with the postmaster at New York, and are fur- ıhed with a limited number of blank drafts to draw against them, as ; exigencies of their business may require. The postmaster at New ·rk has paid drafts of this character to the amount of $6,796,825. In ; Pacific States postmasters who required assistance have been ·nished with funds to the amount of $55,823.65 by the postmaster at n Francisco, Cal., and $33,857 by the postmaster at Portland, Oregon.

Out of the whole number of orders paid, the payment of 27 was alleged have been made to individuals fraudulently personating the payees l forging their signatures, or by other unlawful or improper means, ng at the rate of one alleged erroneous payment out of 183,435 pay- nts.

Fifty-one claims for re-imbursement on account of wrongful payments ·e been under consideration during the last year, twenty-four of ich were for orders the payments of which had been effected in prior ırs. In seven of these claims the amount of the orders, $147.25, was overed by special agents and paid to the rightful owners; in sixteen es, amounting to $368.18, the paying postmasters were, after careful estigation, held responsible, and, under instructions from the Depart- nt, have effected payment to the proper payees out of their own re- rces; in six cases, amounting to $113, the wrongful payments were nd to have been made through no fault of the paying postmasters, l they were, therefore, furnished with funds by the Department to ke proper payment; in one case the amount, $5, was, after due ·mination, found to have been improperly paid through the fault of remitter and of the issuing postmaster, and they, accordingly, made amount good to the payee; in another case, amounting to $25, the ee was for a like reason made to bear the loss. Twenty claims, ıunting to $654.24, are still pending.

The number of orders issued in this country payable in Switzerland ing the last year was 2,759, amounting to $68,548.05, and the number ginating in that country, which have been paid here, was 1,080, ıunting to $29,135.78. As compared with the transactions of the

previous year, these figures show a decrease of $3,739.23, or 5.17 per cent. in the issues, and an increase of $7,913.62, or 37.28 per cent. in the payments. The fees received amounted to $1,929.05, and the expenses to $850.78. From the accompanying statement of the Auditor it will be seen that after the payment of all balances due Switzerland on the exchange of money-orders between the two countries during the year a net revenue of $679.11 accrued to the United States. The number of orders issued in this country for payment to beneficiaries in the United Kingdom during the last year was 64,172, amounting to $1,149,382.29, and the number originating in that country which have been paid here was 23,993, amounting to $324,542.80. These figures show, in comparison with the like transactions of the preceding year, a decrease of $341,938.02, or 22.92 per cent., in the issues, and an increase of $20,769.14, or 6.83 per cent., in the payments. The number of orders issued in this country for payment in Germany during the last year was 35,319, amounting to $746,644.54, and the number originating in that country paid here was 17,677, amounting to $620,756.76, showing, as compared with the business of the previous year, an increase of $45,009.81, or 6.41 per cent., in the issues, and of $85,540.04, or 15.98 per cent., in the payments. The fees received for the issue of British money-orders amounted to $34,986.25, and the commissions to postmasters, clerk-hire, incidental expenses, and miscellaneous items amounted to $23,703. The amount of fees received for the issue of German money-orders amounted to $20,498.25, and the commissions to postmasters, clerk-hire, incidental expenses, and miscellaneous items amounted to $10,170.92.

An exact statement of the revenue of the last fiscal year from the exchange of money-orders with Great Britain and Germany cannot, at present, be furnished by the Auditor, as a final adjustment of the accounts of the last quarter of that year has not yet been reached by him and the proper accounting officers of those countries. That from the British business of the preceding year is reported by him at $11,374.72, and that from the German business at $9,130.88.

A postal convention was concluded at Washington on the 8th of June, 1875, a copy of which is hereto annexed, for the exchange of postal money-orders between the United States and the Dominion of Canada. The exchange of money-orders in pursuance of the provisions of this convention was put in operation August 2, 1875. From that date to the 23d of October, inclusive, orders amounting to $45,347.55 were issued in this country for payment in Canada; and orders amounting to $42,860.39 were received from that country for payment in the United States.

The money-order department, the annual transactions of which have reached about eighty millions of dollars, shows an apparent profit of about one hundred and twenty thousand dollars, though it is really in arrears more than that sum if the clerk-hire and stationery required for the business, and now charged against the postal revenues, were trans-

ferred to this account, where they properly belong. The money-order business is nothing more or less than Government banking for the benefit of the public, and those who avail themselves of its benefits should pay its current expenses. Congress at the last session advanced the fees on small money-orders to a point at which it is believed it will, as it should, for the current year and hereafter, pay its own expenses.

AMERICAN STEAMSHIP LINES.

The fact that but one line of steamships carrying our flag is employed in conveying the United States mails across the Atlantic, and none whatever to South America, is humiliating to the just pride of every American citizen. This line makes regular weekly trips from Philadelphia to Liverpool, and carries a small mail in a satisfactory manner for the postages as compensation for the service; but the great bulk of our mails for Europe is carried by steamers under foreign flags, sailing from the port of New York on Tuesdays, Wednesdays, Thursdays and Saturdays of each week. As a matter of national pride, as an aid to the revival of American commerce, and as a means of supplying an efficient steam-marine, available for immediate use by the Government in case of war, provision should be made for the transportation of our mails on important ocean routes in steamships officered and manned by our own citizens and sailing under our own flag.

It is believed that the payment of a moderate mail compensation in excess of the postages now allowed under the provisions of the general law, would enable our citizens to establish and maintain steamship-lines across the Atlantic and to South American ports, which would prove remunerative to the proprietors, and promote the general prosperity of the country. A reasonable allowance for a line to the west coast of South America would assure regular mail communications by American steamers with our sister republics on that coast, and a moderate mail compensation for a line to Japan and China, will doubtless continue the mail-service to those countries in American ships after the termination of the existing subsidy contract, which will expire on the 31st of December, 1876. I think it safe to say that the sum of $500,000 per annum, now granted as a subsidy to the Japan and China line for a single monthly service on that route, would, in addition to the postages on the mails conveyed, be quite sufficient, judiciously apportioned between the respective routes, to maintain an efficient mail-service by steamers sailing under our flag, on all the important ocean-routes which should be occupied by lines of American steamers.

STRAW BIDS.

The officers of this Department are subjected to great annoyance, and the Department itself to great pecuniary loss, by the prevalent system of "straw-bidding" on long and expensive routes. Several stringent

laws have been enacted with a view to the eradication of the ev they have signally failed to accomplish the desired result; int parties, in the teeth of oaths and penalties, still combining togeth employing various devices to prevent fair competition and to sec due advantage by fraud. Under the present statute, in the case ing bidders and contractors, the Postmaster-General is compelle up the list of actual bidders and tender the service to the next bidder *seriatim* until one is found who will consent to contract the price is considered to be too high, to re-advertise, meanwhi forming the service by temporary contract. It is found in actual rience that many whose names appear on these lists are wholl sponsible, often the drivers and agents of the old contractors, wh use of them merely for the purpose of retaining the routes in the grip.

This evil, which annually involves the Department in the loss of hundreds of thousands of dollars, can, in my judgment, be effe removed by such a change in the law as will authorize the Postm General, on the failure of any accepted bidder, to offer the contr at present to the next lowest bidder on the list, if in his judgme bid be not too high; and if this next lowest bidder declines to ent contract, to be authorized to enter into contract with a person bidder, at any price not exceeding said next lowest bid. In c contract can be made with any party at this price, to go on up t in like manner, always giving the bidder the first chance. In th will the Postmaster-General be enabled to command the entire f contractors, the bidders having no control of it unless they wi the contract at the price named.

RAILWAY POSTAL SERVICE.

No antagonisms or serious differences of opinion have occurre ing the last year between the Department and the railroad corpor The Department pays the railroad companies for transportation mails about ten millions of dollars annually, and they, in retur offering all the facilities at their command, and in a manner whic cates the utmost cordiality between them and the Governmen every disposition to advance the interests of the Department. compensation is now based upon the weight of mails carried. M the most intelligent gentlemen controlling these corporations fe it would be more equitable to pay by space. In the estimate m the committee last year, it was found that while the space basis increase the pay of several hundred roads, generally of the large it would reduce it very materially on many of the smaller and w ones, and the Department hesitated to advocate a measure li bring so much antagonism.

During the last few months a new impetus has been given to th way postal service, and new facilities to the business of the count

the establishment of fast-mail lines. Railway post-office cars, in connection with passenger-trains, are now transported at a speed hitherto unattained in the service. Upon one of the largest lines has been placed a postal railway-train under the entire control of the Post-Office Department, carrying no passengers. All these new post-office cars bear the seal of the United States and of the Post-Office Department. It is believed that at no distant day the business of the Department will be so great as to induce the railroad companies to run similar trains from New England to the Gulf, and from the Atlantic to the Pacific.

The following table shows the cost per pound for transporting mails on ten of the leading routes of the country, calculated from the latest returns of the weights of mails and accommodations provided for their distribution, and the rates of pay fixed on those returns:

Routes.	Distance.	Cost per pound.	Remarks.
Between—	*Miles.*	*Cents.*	
New York and Washington	228	1.47	
New York and Boston	241	1.42	Via Springfield.
Chicago and Saint Louis	283	4.72	
Cincinnati and Chicago	310	4.15	Via Indianapolis, La Fayette, and Kankakee.
New York and Cincinnati	757	6.17	Via Philadelphia, Pittsburgh, and Columbus.
New York and Chicago	952	6.03	Three routes; mean distance.
New York and Saint Louis	1,063	11.12	Via Philadelphia, Pittsburgh, Columbus, Indianapolis, and Vandalia.
New York and New Orleans	1,445	23.32	Via Washington, Lynchburgh, Va., Cleveland, Tenn., and Atlanta, Ga.
New York and Galveston	2,086	30.40	Via Saint Louis, Sedalia, Denison, and Houston.
New York and San Francisco	3,357	33.13	Three routes; mean distance.

The cost is greater, in proportion to distance, on the longer lines, in consequence of the lighter average weight of the mails; and on different parts of the longer lines the same disproportion exists, for the same reason, the rates of pay for mail-service on railroads being greater, in proportion to weight, on routes carrying the less amounts. Thus, on the line between New York and Galveston, while on the 90 miles between New York and Philadelphia the cost per pound is only 0.54 cent, on the 50 miles between Houston and Galveston it is 1.2 cents; and while on the 353.6 miles between Philadelphia and Pittsburgh the cost per pound is only 2.28 cents, on the 337.55 miles between Denison and Houston it is 7.56 cents, the average weight of mails per day between New York and Philadelphia being 32,850 pounds, and between Philadelphia and Pittsburgh 21,647 pounds, while between Houston and Galveston it is only 1,918 pounds, and between Denison and Houston 2,181 pounds.

The Lake Shore and Michigan Southern Railroad from Dunkirk to Chicago is common to two of the three routes between New York and

Chicago. The other, via Philadelphia and Pittsburgh, runs over the Pennsylvania and the Pittsburgh, Fort Wayne and Chicago Railroads. The combined average weights between New York and Dunkirk amount to more than 70,000 pounds per day, the average on each route being swelled by heavy local mails, and on the New York Central and Hudson River Railroad by mails from the east coming on at Albany. The average weight per day between Dunkirk and Chicago is less than 28,000 pounds, being diminished by mails passing off at several points, as Cleveland and Toledo; and between Pittsburgh and Chicago the average weight is less than 6,000 pounds per day.

SPECIAL AGENTS.

A new system has been adopted to some extent in regard to the appointment and disposal of special agents. This force is now concentrated, as far as practicable, with headquarters at a few prominent points and appointments have been made, and will continue to be made, almost exclusively from the employés already in some other branch of the service, who, by efficiency, ability, and thorough knowledge of post-office laws and rules, are enabled to become much more quickly versed in the delicate duties required of these officers than would otherwise be possible. Special agents represent exclusively, and are responsible only to, the Postmaster-General, and ought to be entirely adapted by nature and training to the severe and peculiar work imposed upon them.

I would repeat the recommendation made by my predecessor in his annual report for the fiscal year ended June 30, 1873, that any person be permitted, without additional charge, to write a form of presentation in any book, pamphlet, magazine, periodical, or on any other matter of the third class; and, also, that the sender of any package be permitted without additional charge, to write his or her name and address on the outside thereof, with the word "From" above or preceding the same, so as to inform the person addressed of the name of the sender, and to write briefly on any package the number and name of the articles inclosed.

Congress at its last session gave the privilege to members of both Houses to send free through the mails, under such rules and restrictions as the Postmaster-General might prescribe, certain public documents, until the commencement of the next session. The weight of these documents was estimated by the Department at the time to be from two to three hundred tons. Our mail-transportation has now reached such proportions that this printed matter has been distributed without causing any delay in the transportation and delivery of the ordinary mails, and with no perceptible increase of cost or labor.

TRANSIENT PRINTED MATTER.

I recommend that the postage on transient newspapers and periodicals, books, printed matter of all sorts, lithographs and maps, sheet-

music, photographs, and manuscripts designed for publication shall be reduced to one cent for each two ounces or fraction thereof, which was the rate before the enactment of the law advancing it during the closing hours of the last Congress.

NEWSPAPER POSTAGE.

The act of June 23, 1874, requiring prepayment in stamps of postage on newspapers and periodical publications mailed from known offices of publication or news-agencies, and addressed to regular subscribers or news-agents, went into effect on the 1st of January, 1875, and from present indications it will realize about $1,000,000 for the first calendar year. This is not a material variation from the average results of the old law; though during the last year in which this latter was in operation, the amount was increased by the payment of postage on newspapers circulating within the county of publication—a requirement that was discontinued at the end of one year. While, therefore, there has been no increase in the aggregate receipts, there has been a large net gain by saving the commissions on collections allowed by the old law, as under the present law the great bulk of postage is paid at the large offices, whose salaries are not affected by this item. Under the old law there was no check to insure collections at the office of destination, and the consequence was that much matter went unpaid; and it is a satisfaction that, under the present more equitable mode, the universal collections have made up for the reduction in the rates.

The new system has worked so admirably, and has given such general satisfaction, that no change is deemed necessary.

Full information as to the manner of executing the law, with more specific statements of its results, will be found in the accompanying report of the Third Assistant Postmaster-General.

COMPENSATION OF POSTMASTERS.

Under the present law, which bases the compensation of postmasters of the fourth class upon the sale of stamps, loss has been inflicted on the revenues of the Government by sales of stamps to be used elsewhere, particularly in large cities where salaries have reached the maximum provided by law. Many officials have been dismissed for violating the rules of the Department in this respect, but it is impossible, so large is the number, for the Department to prevent wrong practices, or even to any great extent to keep them in check. I recommend that the compensation of postmasters of the fourth class be based upon the business of their respective offices, as determined by the cancellation of stamps, the account to be duly sworn to for each quarter and returned to the Sixth Auditor.

There is a great want of equity in the compensation of postmasters of the first, second, and third class. Under the present law postmasters in small cities and towns, who are required to give a very moderate

bond, and whose business also is not large, may receive the maximum salary. In the larger cities, like Boston, Philadelphia, and Chicago, postmasters doing a postal business of hundreds of thousands of dollars per annum, a money-order business of millions, and giving bonds to the extent of two hundred thousand dollars, receive no greater compensation than that paid in a great majority of the small cities. In many places the salary of the postmaster is the largest in the place, presidents, cashiers, secretaries, and other officers of corporations, whose duties require greater abilities, and whose positions entail vastly greater responsibilities, receiving less. This state of things encourages, and sometimes leads to, an unseemly scramble for these offices. If the salaries at the smaller offices are not excessive, those of the large cities are certainly too low. I find postmasters as a class to be efficient, capable, and attentive, beyond my expectations, and their salaries should bear some proportion to their duties.

Cases are said to exist, however, where few or no duties are actually performed by the postmaster. A law compelling postmasters whose net income is, say, one thousand dollars or more to give their entire attention to the duties of their office, or, failing in this, to employ some person to perform them at their own and not at the Government's expense, would be most undoubtedly beneficial to the service. I have made, and shall continue to make, sobriety an indispensable requisite in every person within my control in all branches of the service.

The Post-Office is a business Department, and should be run on business principles.

POSTAL REVENUES AND EXPENDITURES.

The postal revenues during the last fiscal year have sympathized with the prevalent depression in all branches of trade, showing an increase over the previous year of only 1.13 per cent., which is the smallest increase for many years, and which has induced me to be very moderate in estimating the expected revenues for the year ending June 30, 1877. Wishing to be on the safe side, estimates have been submitted which show an expected deficiency of $8,181,602.19. These have been based upon existing laws and upon the existing state of things. If business revives and expands, as it must if we may judge the future by the past, and if the laws in relation to compensation of postmasters are modified in accordance with the recommendations of this report, the deficiency for that year will be very much less than the estimates.

The deficiency of the Post-Office Department should by no sound rule of business increase in percentage if it must in amount. If my expectations should prove correct for the year ending June 30, 1877, there will be no increase in the percentage of deficiency, but on the contrary a decrease. Basing the estimate of the revenues at the smallest amount, and of the expenditures at the largest, an increase is shown in

percentage of the deficiency of only 19.39 against 24.65, which was estimate of the percentage of increase of the deficiency of last year : that of its predecessor. A wide gap at the end of a year between ipts and expenditures, and on the wrong side of the ledger, is any-g but a pleasant fact for a business man to confront. With proper chfulness and economy in this Department, always requiring maxi-n service at minimum cost, as in any other business, this gap between enditures and receipts can be gradually closed, and in time be made isappear altogether. Important as it is to reduce the deficiency, nust not be forgotten that in the sparsely-settled portions of the th and West, the expenditures for mail-service must, in many ances, exceed the receipts two or three, and sometimes ten fold. ı desirable on all accounts that our country should be settled by lligent people, and with this end in view the pioneers should en-frequent and regular mail-communications with the more populous ions. Probably there is no tax our people will more cheerfully bear, ·ided they can feel certain that the money has been judiciously ex-led, than that made necessary by providing first-class postal facili-throughout the entire extent of our magnificent domain.

Very respectfully, your obedient servant,

MARSHALL JEWELL,
Postmaster-General.

he PRESIDENT.

APPENDIX.

l.—*Estimates for expenditures for the fiscal year ending June* 30, 1877.

of the Postmaster-General:			
ations and special agents		$160,000 00	
		103,000 00	
and publication of post-route maps		35,000 00	
			$298,000 00
the First Assistant Postmaster-General:			
on to postmasters		7,500,000 00	
st-offices		3,650,000 00	
letter-carriers		2,100,000 00	
aper		20,000 00	
wine		50,000 00	
l rating stamps		10,000 00	
ces and scales		7,000 00	
and fuel		450,000 00	
are		35,000 00	
		55,000 00	
ls and incidental items		145,000 00	
			14,022,000 00
the Second Assistant Postmaster-General:			
portation		17,548,000 00	
t-office clerks		1,309,447 29	
s		1,050,000 00	
messengers		172,800 00	
s		109,521 72	
gers		729,186 98	
id keys		20,000 00	
id mail-bag catchers		200,000 00	
			21,138,955 99
the Third Assistant Postmaster-General:			
nps	$147,762 00		
agency	6,900 00		
velopes and newspaper-wrappers	535,878 00		
agency	16,300 00		
	216,760 00		
agency	6,100 00		
		929,700 00	
ackage envelopes, locks, and seals		40,000 00	
pes		40,000 00	
envelopes		2,150 00	
oat, and way letters		7,500 00	
ed States attorneys, marshals, clerks of courts, el necessarily employed by special agents of ffice Department, subject to approval by the General		7,500 00	
printing, and binding drafts and warrants		1,500 00	
ls items		2,500 00	
			1,030,850 00

Under the Superintendent of Foreign Mails:		
Transportation of foreign mails	$300,000 00	
Balances due foreign countries	50,000 00	
Total		$350,000 00
Total estimated expenditures		36,839,805 99
Amount which will be provided by the Department from its own revenue, accruing from postages and other sources, estimated		28,658,203 80
Excess of expenditures to be provided by appropriation out of the general Treasury		8,181,602 19
Special appropriations to be made out of the general Treasury:		
For official postage-stamps and stamped envelopes, for use of the Post-Office Department during the year		850,000 00
For mail-steamship service between San Francisco, Japan, and China		250,000 00
Total amount to be provided out of the general Treasury		9,281,602 19

EDWARD W. BARBER,
Third Assistant Postmaster-General.

POST-OFFICE DEPARTMENT,
APPOINTMENT OFFICE,
Washington, D. C., October 19, 1875.

SIR: Agreeably to your request, I submit herewith estimates of the appropriations necessary for the fiscal year ending June 30, 1877, under the following heads, viz:

For compensation to postmasters	$7,500,000 00
For clerks in post-offices	3,650,000 00
For letter-carriers	2,100,000 00
For wrapping-paper	20,000 00
For twine	50,000 00
For marking and rating stamps	10,000 00
For letter balances and scales	7,000 00
For rent, fuel, and light	450,000 00
For office-furniture	35,000 00
For stationery	55,000 00
For miscellaneous and incidental items	145,000 00
Making in the aggregate	14,022,000 00

The estimates for compensation to postmasters, for pay of clerks in post-offices, and for pay of letter-carriers are increased, but the amounts are deemed necessary to provide for growth of the service.

Accompanying this is a tabular statement, marked A, giving more definite information.

I am, sir, respectfully, your obedient servant,

J. W. MARSHALL,
First Assistant Postmaster-General.

HON. E. W. BARBER,
Third Assistant Postmaster-General.

items for the fiscal year ending June 30, 1876, with the per centum of increase or decrease of the same compared with the expenditures of the previous fiscal year, together with the estimates for the same items for the year ending June 30, 1877, with the per centum of increase or decrease for the same compared with the appropriation for the fiscal year ending June 30, 1876.

Items.	Estimate for the fiscal year ended June 30, 1875.	Appropriation for fiscal year ended June 30, 1875.	Expended during the fiscal year ended June 30, 1875.	Per centum of increase or decrease of expenditure over appropriation for fiscal year ended June 30, 1875.		Appropriation for the fiscal year ended June 30, 1876.	Per centum of increase or decrease over expenditures for the fiscal year ended June 30, 1875.		Estimate for the fiscal year ending June 30, 1877.	Per centum of increase or decrease over appropriation for the fiscal year ending June 30, 1876.	
				Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.
For compensation to postmasters	$6,500,000	*$7,100,000	§$7,348,123 10	3.49	.....	$7,000,000	.....	4.97	$7,500,000	7.14	.....
For clerks in post-offices	3,250,000	†3,400,000	3,414,811 26	0.44	.....	3,500,000	2.49	.....	3,600,000	2.8	.....
For payments to letter-carriers	2,000,000	1,900,000	1,879,210 11	.....	1.09	2,000,000	6.42	.....	2,100,000	5.0	.....
For wrapping-paper	27,000	27,000	11,567 10	.....	57.16	25,000	116.13	.....	20,000	.....	20.00
For twine	48,000	48,000	43,811 57	.....	8.72	55,000	25.54	.....	50,000	.....	9.09
For marking and canceling stamps	9,000	9,000	5,943 23	.....	33.97	10,000	68.27	.....	10,000	.....	.....
Fot letter-balances	3,000	‡33,000	19,449 24	.....	41.06	3,000	84.57	.....	7,000	133.33	.....
For scales, special estimate	30,000										
For rent, fuel, and light	660,000	660,000	389,638 85	.....	40.96	500,000	28.39	.....	450,000	.....	.10
For furniture	$6,500	66,500	152,139 23	128.78	.....	$35,000	54.46	.....	$35,000	.....	.....
For stationery	60,000					50,000 / 150,000 = 235,000			55,000 / 145,000 = 235,000		
For miscellaneous items											
Total	12,593,500	13,243,500	13,264,693 69	0.16	.....	13,328,000	0.48	.....	13,972,000	4.83	.....

* Post-Office Department appropriaton bill, statutes 1873–'74, ch. 456, p. 231 ..... $6,500,000
Deficiency bill, statutes 1874–'75, section 2, p. 413, (compensation to postmasters) 300,000
Deficiency bill, statutes 1874–'75, section 3, p. 414, (retroactive salaries to postmasters) 300,000
7,100,000

† Post-Office Department appropriation bill, statutes 1873–'74, ch. 456, p. 231 ..... $3,250,000
Deficiency bill, statutes 1874–'75, section 2, p. 413 150,000
3,400,000

‡ Post-Office Department appropriation bill, statutes 1873–'74, ch. 456, p. 231 ..... $3,000
Special appropriation, statutes 1874–'75, ch. 1, p. 291, (scales for post-offices) 30,000
33,000

§ For annual compensation to postmasters $7,049,935 77
On account of retroactive salaries to postmasters 298,187 33
7,348,123 10

APPOINTMENT OFFICE, POST-OFFICE DEPARTMENT, *October* 20, 1875.

POST-OFFICE DEPARTMENT,
OFFICE OF THE SECOND ASSISTANT POSTMASTER-GENERAL,
Washington, D. C., November 9, 1875.

SIR: To enable you more readily to make up such portions of your annual report as refer to the transportation of the mails, I herewith submit estimates for the fiscal year commencing July 1, 1876, of the several items of appropriation to be expended in the Office of the Second Assistant Postmaster-General.

It will, perhaps, be of service to the committees of the two Houses of Congress to have a brief explanation of the objects of the appropriations; and hence I will furnish such explanations under separate and appropriate heads.

INLAND-MAIL TRANSPORTATION.

The transportation of domestic mails, or mails of the United States, is denominated "inland-mail transportation," to distinguish it from the service required in conveying foreign mails. It consists of three kinds of service, to wit: First, such as is performed by railroads, whose compensation is determined by weight of mails carried, and car-space and railway-post-office cars furnished, (see Rev. Stats., pp. 777, 778, secs. 4002, 4003.) The law authorizes the Postmaster-General to contract with railway companies for carrying the mail without advertising therefor, (see Rev. Stats., p. 770, sec. 3942.) Second, steamboat service, which may be contracted for with or without advertising, as the Postmaster-General may believe the public interest and convenience shall require, (see Rev. Stats., p. 770, sec. 3943.) Third, all other service than that performed by railways and steamboats, and known in the Department as "star" service, to be executed with "celerity, certainty, and security." The law requires that contracts for carrying the mails on "star" routes shall be made with the lowest bidder in each case, who shall propose to perform the service in accordance with a previous advertisement therefor, (see Rev. Stats., p. 769, sec. 3941.)

During the fiscal year ended June 30, 1875, the cost of inland-mail transportation was as follows, to wit:

On 871 railroad-routes, aggregating 70,083 miles in length	$9,216,518 00
On 89 steamboat-routes, aggregating 15,788 miles in length	684,130 00
On 7,323 other routes, designated "star-routes," aggregating 192,002 miles in length	5,453,721 00
Total cost during last fiscal year	15,353,369 00

Which was an increase of 8,776 miles in the length of routes over the preceding year, and a decrease of $48,688 in the cost thereof.

The appropriation to cover the expenditure for inland transportation during the present fiscal year is $17,548,000, and the same sum is estimated for the next year.

At the commencement of the present fiscal year, I adopted a plan of book-keeping in this Office by which the cost of the mail-service in operation at the close of each month can be ascertained. The reports for the first three months of the year are now before me, and from them I obtain the data for estimating the probable necessary expenditures of the next year.

The cost of mail-routes in operation July 1, 1875, (the commencement of the present fiscal year,) was	$14,949,669 13
To which has been added an increase for July, August, and September, of $189,793.61, which, being considered an average increase for the several quarters of the year, would make the increase during the entire year	759,174 44

Add to this the recognized service of railroads, (which is explained below,) estimated at	$762,489 79
Making probable cost of inland transportation for present year	16,471,333 36

The above calculation is as reliable as any that can be made concerning the cost of a service during nine months yet to come. It is sufficiently accurate to enable me to say that no extraordinary expenditures will likely be necessary which can swell the annual cost of this service more than two hundred thousand dollars above the sum exhibited in the above estimates. Therefore, without resorting to the calculation by per cent. of increase, heretofore relied on in this Office as a guide in estimating future expenditures, I think it safe to say that an appropriation for the next year equal to that provided for this year will be sufficient.

In the above table reference is made to the probable cost of "recognized service by railroads," and some explanation thereof may be necessary. The law of March 3, 1873, fixing the compensation of railroads for carrying the mails, requires that their pay shall be re-adjusted on the basis of the actual weights of mails carried thereon once in every period of not more than four years.

At the close of the last fiscal year the mails were carried on eighty-four railroads in the United States, whose pay had not been determined under the law, for the reason that no weights had been taken of the mails they carried. The cause of delay, in most of these cases, originated in the carelessness and failure of the companies to take said weights when asked to do so by the Department. Hence it becomes necessary to recognize their service, provisionally, at the rates of pay under the previous law, subject to re-adjustment on weights yet to be taken, which re-adjustment will antedate to July 1, 1873, the date at which the existing law took effect. Such recognition, however, is not ordered except in cases where the railroad companies offer satisfactory explanations of their non-compliance with the law, or where their necessities are urgent; but it is estimated that the entire cost of such service (which will probably have to be paid for at some time during the year) will reach the sum of $762,489.92.

RAILWAY-POST-OFFICE CLERKS.

Clerks of this class are employed at salaries ranging from $1,000 to $1,400 per annum to assort the mails *en route* on lines of railroad carrying post-office cars. They perform the labor formerly devolving on clerks in the several distributing post-offices of the United States, which consists in separating the mails for different post-offices on their respective lines, and for other offices and railway lines with which they connect, so as to expedite their delivery by avoiding the delays heretofore incident to having such mails assorted in the distributing-office nearest to the point of delivery. By this plan, mails are sent in bulk from the mailing-offices to the postal clerks, who assort them in transit, put them up in packages for the offices of delivery, and bag them by the most direct route to the places of destination.

During the last fiscal year railway-post-office cars were used on sixty-two lines of railroad, (as will more fully appear by reference to Table II in the appendix,) and nine hundred and one postal clerks were employed thereon at an annual cost of $1,122,640, as follows, to wit: 326 clerks, at a salary of $1,400 each; 457 clerks, at a salary of $1,200 each; 117 clerks, at a salary of $1,000 each; and 1 assistant clerk, at a salary of $840.

The increase in the aggregate salaries of postal clerks last year over the preceding one was 6.09 per cent., while the appropriation for the current year is $1,257,141, or 11.98 per cent. more than the cost of last year. Since the close of the last fiscal year orders have been issued for extending this class of service between Pittsburgh and Saint Louis, and between Pittsburgh and Cincinnati, and for increasing it by the addition of another daily line of postal cars between New York and Pittsburgh, which will likely result in increasing the aggregate salaries of postal clerks in a greater percentage than the year before. It is believed, however, that the present appropriation will be ample to meet the increased expense; but it is safe to calculate that a further increase will be required for the next fiscal year. Hence, I recommend that an appropriation of $1,309,447.29 be asked, which will be an increase of only 4.16 per cent. over the appropriation for the current year.

ROUTE-AGENTS.

Route-agents are employed at salaries ranging from $900 to $1,200 each per annum on railroad and steamboat lines, to make up pouches of mails for post-offices on their respective routes, and, in some instances, for connecting lines. Their duties differ from those of railway-post-office clerks, in that they only assort packages of mails previously made up at mailing-offices and by railway-post-office clerks, and pass them over in bags to messengers for delivery at the several post-offices on their respective lines.

There was paid during the last fiscal year to route-agents the sum of $943,800, which was an increase of 5.25 per cent. over the cost of the preceding year. An appropriation of $1,050,000 is provided for the current fiscal year, which, in my judgment, will not all be expended. An appropriation of a like sum for the next year will probably meet the wants of the service.

MAIL-ROUTE MESSENGERS.

On short lines of railroad, and on parts of railroads in process of construction, it frequently happens that the amount of mails carried and the number of post-offices to be supplied are too great to be properly assorted and supplied in locked pouches sent in charge of baggage-masters or other train-employés, and yet too small to justify the employment of route-agents at the compensation fixed by law. In such cases it has been found convenient and economical to appoint another class of employés denominated "mail-route messengers," whose duties are similar and yet lighter than those of route-agents proper, and who are paid such salaries as the Postmaster-General believes to be proper in each case, generally from $300 to $700 each per annum, depending on the length of the runs and the amount of labor to be performed in each case.

The amount paid to mail-route messengers last year was $147,470, an increase of 8 per cent. over the preceding year. The appropriation for the current year is $160,000, or 8.42 per cent. above the cost of last year. Believing it to be a matter of economy to use this class of employés in many instances where route-agents would otherwise have to be appointed at a higher compensation, I respectfully recommend that an appropriation of $172,000, or an increase of 8 per cent., (which is about equal to the increase of the two preceding years,) be asked for to cover the cost of their services the coming fiscal year.

LOCAL AGENTS.

Local agents are employed at railroad-crossings, and in the larger towns and cities, to receive mails delivered by trains and assort them

onnecting lines, and for post-offices near by. Great care is taken etail them for duty only at points where the labor could not be per-ed by any other class of employés. Their compensation is deter-d in each case by the number of mails to connect, the amount of r performed, and the number of hours per day they are required to n duty.

uring the last fiscal year one hundred and twenty-five local agents in the service of the Department, at an aggregate cost of $96,580, average of $772.64 each. The salary paid is, however, not uniform. nany cases where the labor is light, station baggage-masters and r trustworthy depot-hands are appointed as local agents at nominal s of pay, while in the larger towns and cities the labor is so great in instances as to require the attendance, day and night, of a compe-business man with a corps of efficient assistants.

e cost of the employment of local agents the last fiscal year, over cost of the year before, was 1.97 per cent., while the appropriation 115,000 for the present year is 19.07 per cent. above the cost of last . The existing appropriation will not all be expended, and it is no bt greater than will be required for next year. After careful calcu-n, I have concluded to recommend an appropriation of $109,521.72 the next year.

MAIL-MESSENGERS.

ail-messengers are employed in connection with railroad and steam-t routes, to carry the mail to and from post-offices, and to transfer ls, when necessary, from station to station on such routes, at the low-rate that can, after advertisement, be obtained for such service. y are also frequently appointed to carry mails over very short routes, re it is evident that the service can be more efficiently performed in way than by letting it on regular contract. They are not, except few cases, required to execute contracts, nor are they appointed for finite period. In this way, they can be changed whenever cheaper ice can be had, or for neglect of duty. There were three thousand n hundred and forty of them in the service of the Department dur-the last fiscal year, at a cost of $621,311. The appropriation of 0,000 for the present year will probably not all be expended, but a ht increase for next year will no doubt be required; and I therefore mmend an appropriation therefor of $729,186.98.

MAIL LOCKS AND KEYS.

ontracts for furnishing locks and keys are awarded upon advertise-t for proposals therefor. Full information of existing contracts can btained by referring to the table below:

Description of contracts for mail locks and keys.

les contracted for.	Names of contractors.	Residence.	Term of contract.		Prices paid.	
			From—	To—	Locks	Keys.
tered-mail locks keys.	F. W. Mix	Terryville, Conn	Jan. 1, 1874	Jan. 1, 1878	$1 75	$0 30
r-box locks and s.	Smith & Egge ..	Bridgeport, Conn	Jan. 1, 1874	Jan. 1, 1878	1 25	15
bag locks and keys	James C. Mix...	Syracuse, N. Y..	July 1, 1870	July 1, 1874	74	13

* Extended four years from July 1, 1874, (December 31, 1873.)

During the last fiscal year, new locks and keys were introduced in th service at a cost of $31,811.42; the number of each description pur chased can be seen by reference to Table G, appended to my detailed report. The appropriation for the current year is $30,000, which i ample; and a smaller appropriation for next year will be sufficient. therefore recommend that an appropriation of $20,000 be asked for.

MAIL-BAGS AND MAIL-BAG CATCHERS.

Mail-bags are also purchased by the Department of contractor whose contracts are awarded after advertising for proposals therefo Supplies are now being furnished on such contracts for all kinds mail-bags, except the several sizes of leather pouches, for which bid have been invited during the present month. During the last fisc year the sum of $187,148.88 was expended in the purchase and repa of mail-bags and catchers. The appropriation for the present year $210,000, all of which will probably not be required. An appropriatic of $200,000 for the next year will, in my judgment, be sufficient.

The following table will show the name and residence of contractor the date of the commencement and termination of their contracts, ar the prices paid for each size and kind of bags:

Description of contracts for mail-bags.

Articles contracted for.	Names of contractors.	Residence.	Term of contract.		Prices paid.		
			From—	To—	Size No. 1	Size No. 2.	Si No
Jute-canvas mail-sacks.	John Boyle.....	New York, N. Y.	July 1, 1875	July 1, 1879	$0 66	$0 52	$0
Cotton-canvas mail-sacks.	....do	....do	July 1, 1875	July 1, 1879	1 32	1 02	
Leather horse-mail-bags.	Polydore S. Thomson.	....do	July 1, 1875	July 1, 1879	6 60	5 60	5
Mail-catch'r pouches	John Boyle.....	....do	July 1, 1875	July 1, 1879	.....	.....	4
Label-cases.....	Gaylord Manufacturing Co.	Chicopee, Mass..	July 1, 1875	July 1, 1879	.....	.....	

The mail-bag catchers used by the Department, and the only ones th have been submitted which will answer the purpose, are covered by le ters-patent, and can, therefore, only be purchased of a manufactur who has obtained an assignment of the patent, or the right to use i They were patented by L. F. Ward, of Elyria, Ohio, and are manufa tured by Abbott, Brew & Co., of Cleveland, Ohio, at fifteen dollars eac No catchers were purchased during the last fiscal year, but repairs o those in use were made, at a cost of $675.25, as will be seen by referenc to Table G, appended to my detailed report.

The table hereto appended exhibits the several items of expenditur in this office during the last two fiscal years, compared with the appro priations for the present, and the estimates for the next fiscal year; and also the interesting fact that the appropriations asked for next year exceed those provided for this year in the sum of only $77,414.99.

I have the honor to be, sir, very respectfully, your obedient servant,

JAS. N. TYNER,
Second Assistant Postmaster-General.

Hon. MARSHALL JEWELL,
Postmaster-General.

Cost of inland transportation and the items incident thereto for the years 1874 and 1875, with the appropriation for 1876, and the estimates of the amounts necessary to be appropriated for 1877; showing the percentage of increase and decrease, with the cost, appropriation, and estimate for mail locks and keys, mail-bags and mail-bag catchers.

Object.	Cost for 1874.	Cost for 1875.	Per centum increase or decrease of 1875 over 1874.		Appropriation for 1876.	Percentum of increase or decrease of appropriation of 1876 over cost of 1875.		Estimate for 1877.	Per centum increase or decrease over appropriation for 1876.	
			Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.
Inland transportation	$15,402,057 00	$15,353,369 00	.....	0.31	$17,548,000	14.29	.....	$17,548,000 00	.....	.....
Railway post-office clerks	1,058,200 00	1,122,640 00	6.09	.....	1,257,141	11.98	.....	1,309,447 29	4.16	.....
Route-agents	896,680 00	943,800 00	5.25	.....	1,050,000	11.25	.....	1,050,000 00	.....	.....
Mail-route messengers	136,540 00	147,470 00	8.00	.....	160,000	8.42	.....	172,800 00	8.00	.....
Local agents	94,710 00	96,580 00	1.97	.....	115,000	19.07	.....	109,521 72	.....	4.76
Mail-messengers	595,772 00	621,311 00	4.28	.....	700,000	12.66	.....	729,186 98	4.17	.....
Mail locks and keys	40,143 71	31,811 42	.....	20.75	21,400	.....	32.72	20,000 00	.....	6.54
Mail-bags and mail-bag catchers	212,714 76	187,148 08	.....	12.01	210,000	12.21	.....	200,000 00	.....	4.76
	.....	.....	.....	.....	21,061,541	.....	.....	21,138,955 99	.....	.....

JAS. N. TYNER,
Second Assistant Postmaster-General.

POST-OFFICE DEPARTMENT,
OFFICE OF THIRD ASSISTANT POSTMASTER-GENERAL,
Washington, D. C., November 2, 1875.

SIR: Herewith I have the honor to submit the following tables, viz:

1. Estimate of the expenditures and revenue of the Post-Office Department for the fiscal year ending June 30, 1877.
2. Statement of payments under sundry heads, charged by the Auditor to the miscellaneous account.
3. Estimate of indebtedness of the Department for the two past fiscal years.
4. Receipts and expenditures for the fiscal year ended June 30, 1875, compared with the two preceding years.
5. Receipts and disbursements on account of the Post-Office Department at Treasury depositories.
6. Receipts and disbursements at post-office depositories.
7 and 8. Number and value of postage-stamps, stamped envelopes, newspaper-wrappers, and postal cards issued during the year.
9. Number and value of official postage-stamps, stamped envelopes and wrappers furnished the different Executive Departments during the year.
10. Statement showing increase in issues of postage-stamps, stamped envelopes, newspaper-wrappers, and postal cards, of all kinds.
11. Number and value (actual and nominal) of dead-letters received and disposed of during the year.
12. Statement showing classification and disposition of letters containing valuable inclosures.
13. Statement showing number, contents, and disposition of registered letters received during the year.

EXPLANATION OF ESTIMATES.

Your attention is respectfully invited to the following detailed statement touching the appropriations asked for by this Bureau:

ADHESIVE POSTAGE-STAMPS.

The number of ordinary postage-stamps issued during the fiscal year ended June 30, 1875, was	682,342, 470
Add 10 per cent., being about the average yearly rate of increase	68,234, 247
Gives estimated issue of ordinary stamps for fiscal year ending June 30, 1876	750,576 717
Add 10 per cent., as before	75,057, 671
Gives estimated issue of ordinary stamps for fiscal year ending June 30, 1877	825,634, 388
Cost of manufacturing that number at present contract-price, 14.99 cents per thousand	$123,762 00
Add estimated cost of manufacturing official stamps, and also of manufacturing the newspaper and periodical stamps required by act of Congress approved June 23, 1874	24,000 00
Gives estimated total cost of manufacturing adhesive postage-stamps during fiscal year ending June 30, 1877	$147,762 00

In the above estimate the issues of ordinary stamps for the year ended June 30, 1875, and the average rate of increase per year, are taken as a thoroughly safe basis of calculation. For the official stamps and the newspaper and periodical stamps, the estimate is based upon

t information obtainable. The contracts for manufacturing expire May 1, 1877, but it is not probable that there will be any l deviation, under a new contract, from the present rates.

POSTAGE-STAMP AGENCY.

f distributing agent and assistants	$5,900 00
l expenses of agency	1,000 00
tal	6,900 00

are three persons at present employed at this agency, viz, an /hose salary is $2,500, and two clerks, whose salaries are $1,800 500 per annum, respectively. No increase is asked for. ıcidental expenses are for the purchase of stationery and furni- d for the necessary expenses of the agent when required to visit artment, or while absent from New York in making any inves- ordered by this office; also the expenses of other agents di- o make investigations connected with the issue of postage-

IARY AND OFFICIAL STAMPED ENVELOPES AND WRAPPERS.

of stamped envelopes and newspaper wrappers, both ordinary cial, issued during the year ended June 30, 1875, at present con- ices, was	$372,137 55
r cent. for increase	74,427 51
mated cost for year ending June 30, 1876	446,565 06
r cent. for increase, as before	89,313 01
mated cost of manufacture for the year ending June 30, 1877	$535,878 07

estimated percentage of increase is somewhat larger than the for the past few years; but it is justified by the increasing ity of stamped envelopes, growing both out of their intrinsic nd the lower rates at which they are furnished to the public ıe new contract. This contract is for four years, and will not ıntil September 30, 1878. The prices for the manufacture of l envelopes will therefore remain unchanged.

STAMPED-ENVELOPE AGENCY.

f agent and assistants	$15,300 00
l expenses of agency	1,000 00
tal	$16,300 00

estimate agrees in amount with the present appropriation. The al expenses of this agency, situated in Hartford, Conn., where elopes are manufactured, are of the same character as those of age-stamp agency at New York.

POSTAL CARDS.

f postal cards issued during the fiscal year ended June 30, 1875	107,616,000
r cent. for increase	21,523,200
mated issue for the year ending June 30, 1876	129,139,200
r cent. increase, as before	25,827,840
mated issue for the year ending June 30, 1877	154,967,040
anufacturing that number at present contract-prices, $1.39⅞ per id	$216,760 00

As will be observed, the increase for the last fiscal year over the preceding one was more than 18 per cent. A still larger rate of increase is to be expected, for the following reasons: 1st. The greater popularity of the new style of cards, as evidenced by the fact that the issues for the first month (commencing September 28, 1875) amounted to 20,816,500 cards. 2d. The special demands growing out of the "Centennial," in 1876, for advertising purposes and the wants of the unusually large number of persons that will be in transit during that year.

The present contract will expire April 30, 1877, but it is very unlikely that under a new contract the price of manufacture will vary much from the present.

POSTAL CARD AGENCY.

Salaries of agents and assistants	$5,100	00
Incidental expenses of agency	1,000	00
Total	6,100	00

At present there are employed at Springfield, Mass., in connection with the inspection and distribution of postal cards, an agent, at a salary of $2,500 per annum, and two clerks, one at $1,400 and the other at $1,200 per annum. This force is considered sufficient.

The remarks under the head of "Postage-stamp agency," as to incidental expenses, will apply also to the appropriation required for that purpose for the use of the postal-card agency.

REGISTERED-PACKAGE ENVELOPES.

It is estimated that there will be required for this purpose during the fiscal year ending June 30, 1877, the sum of $40,000. This is a reduction of $25,620 from the appropriation for the current fiscal year, and is due mainly to the cheaper rates at which the envelopes are now obtained.

POST-OFFICE ENVELOPES.

These are plain (unstamped) envelopes, used by postmasters, principally at the smaller offices, for official business, and it is estimated that $40,000 will suffice for their manufacture during the next fiscal year.

This is a reduction of $26,560 from the appropriation for the present fiscal year, and it is based on a falling off in the issues, by reason of the more general use among postmasters of the official stamped envelopes, which have the same general purposes.

DEAD-LETTER ENVELOPES.

The amount estimated for the manufacture of dead-letter envelopes is $2,150; a reduction of $1,600 from the current appropriation. This reduction is owing partly to the decreasing number of dead-letters requiring to be returned, and partly to lower contract-rates.

SHIP, STEAMBOAT, AND WAY LETTERS.

Sections 3913, 3976, 3977, and 3978 of the Revised Statutes make this appropriation necessary, to provide for the payment to masters or owners of vessels, not regularly engaged in transporting the mails, for letters brought and delivered at the post-office, on arrival in port, for transmission to their destination. On delivery of these letters, the party

dressed pays, in addition to the usual postage, the amount paid to e said masters or owners; consequently the amounts paid out come ck to the Department.

The best data upon which to base an estimate for the next fiscal year shown by the following:

d during fiscal year of 1870–'71	$10,716 45
d during fiscal year of 1871–'72	7,011 06
d during fiscal year of 1872–'73	4,259 96
d during fiscal year of 1873–'74	4,188 42
d during fiscal year of 1874–'75	3,753 18
e appropriation for 1875–'76 is	7,500 00
timate for 1876–'77 is	7,500 00

ES TO UNITED STATES ATTORNEYS, MARSHALS, CLERKS OF COURTS, ETC.

This appropriation is required to pay fees and expenses incurred in e prosecution of suits against postmasters and others. Like the last-entioned appropriation, the amount expended in different years is very regular, as shown below:

id during fiscal year of 1869–'70	$8,965 10
id during fiscal year of 1870–'71	6,431 55
id during fiscal year of 1871–'72	5,141 76
id during fiscal year of 1872–'73	6,480 76
id during fiscal year of 1873–'74	4,648 71
id during fiscal year of 1874–'75	5,343 32
e appropriation for 1875–'76 is	7,500 00
timate for fiscal year of 1876–'77	7,500 00

ENGRAVING, PRINTING, AND BINDING DRAFTS AND WARRANTS.

Under this appropriation the Department is supplied with its drafts d warrants used in paying contractors and other creditors, and for e collection of a portion of the balances due the United States by stmasters.

The appropriation made for this object for years past has been $3,000, t as the expenditures under this head for the fiscal year of 1873–'74 s only $1,180.30, and for 1874–'75 only $543.30, I have estimated, as e amount required for fiscal year ending June 30, 1877, $1,500.

MISCELLANEOUS.

This appropriation covers such items of necessary expense as cannot charged to any of the regular appropriations; and, as the items under is head are entirely incidental, it is impossible to ascertain with exact-ss the amount which will be required. The amount heretofore appro-iated having been sufficient to meet expenditures, I estimate for the me amount for the fiscal year ending June 30, 1877, viz, $2,500.

SUMMARY OF ESTIMATES.

The amounts estimated to be required by this Bureau for service of he fiscal year ending June 30, 1877, as compared with appropriations or 1875–'76, are shown by the following table:

Items.	Estimate for 1876-'77.	Appropriated for 1875-'76.
Postage-stamps	$147,762 00	$149,764 00
Expenses of agency	6,900 00	6,900 00
Stamped envelopes and wrappers	535,878 00	446,520 00
Expenses of agency	16,300 00	16,300 00
Postal cards	216,760 00	159,805 00
Expenses of agency	6,100 00	5,600 00
Registered-package envelopes, &c	40,000 00	65,620 00
Post-office envelopes	40,000 00	66,560 00
Dead-letter envelopes	2,150 00	3,750 00
Ship, steamboat, and way letter	7,500 00	7,500 00
Fees to United States attorneys, &c	7,500 00	7,500 00
Drafts and warrants	1,500 00	3,000 00
Miscellaneous	2,500 00	2,500 00
	1,030,850 00	941,320 00
	941,320 00	
Increase of estimates	89,530 00	or about 9 [illegible]%

The increase is entirely upon the two items of stamped envelopes, wrappers and postal cards, occasioned by the increased demand by the public for the same, which, as a matter of course, represents an increased revenue from these two sources.

In the items of registered-package envelopes, post-office envelopes, dead-letter envelopes, and drafts and warrants, you will observe that a material decrease has been made in the estimates for the next fiscal year.

OPERATIONS OF THE BUREAU.

The operations of this Bureau, through its different divisions, are fully set forth by the following detailed statements:

DIVISION OF FINANCE.

During the fiscal year ended June 30, 1875, there were furnished to this division 4,787 contracts for mail-service, (an increase of 1,507 over last year,) for record upon its books, and 6,008 orders of the Postmaster-General (an increase of 232 over last year) recognizing mail-service not under contract; extending or curtailing service, or for the modification of previous orders, which were also recorded.

These contracts and orders furnish full and complete data by which to insure correct payments to mail contractors, and consequently make this division a perfect check on the other offices that pass upon contractors' accounts.

Thirty thousand four hundred and thirty-six Auditor's reports, (an increase of 2,436 over last year,) for pay of mail-contractors and other creditors of the Department, were received, verified, recorded, and paid.

Cash accounts of receipts and disbursements were kept with 45 treasury depositories, (against 33 for last year,) from which were received 980 transcripts of accounts, involving the sum of $12,700,000, against which sum there were drawn, registered, and posted to the proper accounts 12,278 warrants, an increase of 1,629 over last year.

These warrants, each accompanied by a circular receipt, were mailed to the payees, and the receipts, when returned, entered upon the books to show the delivery of the warrants.

(Table No. 5, attached to this report, shows the cash transactions at Treasury depositories in detail.)

To facilitate the business of the Department, the number of post-office depositories was reduced during the year from 179 to 128, at which the

eipts and disbursements involved the sum of $3,586,248.81, divided follows: Receipts from proceeds of the depositories themselves, 335,915.51; from collection drafts on other offices, $150,412.04; and n deposits by other offices, $599,921.26. Against the aggregate accu- lation in the depositories, there were drawn and posted to the legiti- e accounts 18,258 drafts, (an increase of 349 over last year.)

n addition to the amount paid out upon drafts, ($2,041,940.82,) the 1 of $1,851,913.48 was paid to route-agents, postal clerks, mail-mes- gers, letter-carriers, &c., which sum entered into the accounts kept h the depositories.

'he number of statements of account received from the postmasters these 128 depositories during the year was 1,536. (Table No. 6 of s report shows the cash transactions at post-office depositories in ail.)

The number of depositing offices averaged, during the year, 3,000; nding on June 30 at 2,748, from which offices there were received 54 certificates of deposit, amounting in the aggregate to $4,963,571.34, ich amount was duly credited to the postmasters making the de- sits.

The number of circulars sent out during the year was 19,922; the mber of quarterly statements of account furnished to postmasters as 1,804; and the number of letters received and acted upon in the ansaction of the business of the division, together with those written, ceeded 2,500 in number.

As shown by the foregoing, there has been a general increase of the ork in this division, and, in the natural course of events, it will con- nue to increase in the future at about the same ratio.

VISION OF POSTAGE-STAMPS, STAMPED ENVELOPES, AND POSTAL CARDS.

The number of ordinary adhesive postage-stamps issued to postmas- rs for sale to the public during the year was 682,342,470, valued at 8,271,479; of newspaper and periodical stamps, the use of which be- n January 1, 1875, 2,209,215, valued at $815,902.47; of ordinary amped envelopes, plain, 72,285,150, valued at $2,046,111.35; of stamped velopes bearing a return request, 54,631,000, valued at $1,791,686.25; ordinary newspaper-wrappers, 22,850,250, valued at $286,679.74; of stal cards, 107,616,000, valued at $1,076,160; of official postage-stamps sued to the Executive Departments for official use, 18,495,940, valued $834,970.25; and of official stamped envelopes and wrappers, 12,- 5,000, valued at $354,522.18; making a total number of 973,275,025, d a total value of $25,477,511.24. The increase in the value of ordi- ry issues over the preceding year was $2,219,794.05, or 10.05 per cent. e increase, including the issues for official use, was $1,639,984.62, or 7 per cent.

There were also issued within the year 3,379,900 registered-package velopes, 10,024,825 post-office envelopes, and 1,931,500 dead-letter en- lopes; total, 11,956,325.

The total number of requisitions filled was 344,806, as follows: For linary postage-stamps, 97,172; for newspaper and periodical stamps, 72; for official postage-stamps, 39,257; for ordinary stamped envel- es and wrappers, plain, 43,673; for special-request stamped envelopes, 240; for official stamped envelopes, 2,929; for postal cards, 30,968; registered-package envelopes, 36,470; and for post-office envelopes, 925.

The number of packages of ordinary postage-stamps forwarded w 98,648; of newspaper and periodical stamps, 5,173; of official posta stamps, 38,610; of ordinary stamped envelopes and wrappers, pla 62,099; of special-request envelopes, 42,199; of official stamped en lopes, &c., 6,440; of postal-cards, 32,631; of registered-package en lopes, 37,230; and of post-office envelopes, 36,432; total, 359,462.

The losses of packages in transit through the mails amounted to on $256.30, out of an aggregate of $25,477,511.24.

The work of this division consists mainly of filling requisitions, though there is much additional labor in the preparation of permane records, the examination of vouchers, the auditing of postmasters' re turns of official stamps, the adjustment of damaged and unsala le stock returned, and of losses by fire and in the mails, and in a vari ty of other details that need not be specified.

The total number of requisitions filled during the fiscal year, as be fore stated, was 344,806, or an increase over the previous year of 16.9 per cent.; and this ratio will fairly represent the increase in the amount of work performed. Notwithstanding the increase of work, there has been no increase of force asked for, either in the division proper or in any of its branches—the several agencies engaged in supervising the manufacture of postage-stamps, stamped envelopes, and postal cards.

The act of Congress approved June 23, 1875, for the prepayment of postage on newspapers and periodicals mailed from known offices of publication or news agencies, went into effect on the 1st January, 1875, and some information may accordingly now be obtained as to the results of the law. During the six months ending on the 30th June the amount collected from this source was $486,443.49, from 18,843,621 pounds at 2 cents per pound, and 3,652,369 pounds at 3 cents per pound. The New York post-office alone mailed 6,174,286 pounds at the former, and 1,477,272 pounds at the latter rate, realizing $167,804.66. The returns for the quarter ending on the 30th September have not yet all been received, but the indications are that it will not vary materially in amount from either of the previous quarters.

The plan indicated in my report of last year for carrying the law into effect has proven so satisfactory, that it has not been found necessary to change it in a single particular. This Office has been in receipt of letters from the postmasters at many of the larger offices warmly commending the operations of the new law.

DIVISION OF REGISTERED LETTERS.

Since my last annual report, the efficiency of this division has been increased by the transfer to it of several clerks from other branches of the service. These clerks are now engaged in arranging, classifying, and recording the reports of the number of letters registered, and the fees collected thereon, at each post-office, so that hereafter it will be practicable to make a full and accurate showing of the number of letters registered, the amount received for fees, the expense of the system, and its value as a part of our postal service.

At the present time the growth of the system can only be estimated by comparing the number of registered-package envelopes issued during the last fiscal year with the preceding year, from which it appears that 2,922,000 were issued to postmasters during the year 1873–'74, and 3,379,900 during the year 1874–'75; an increase of 457,900, or over 15 per cent. It is fair to take this percentage as representing the growth of the system in a single year.

The value of the registered-letter system is apparent in the transac-
ns of the Post-Office Department. All packages of postage-stamps,
mped envelopes, newspaper-wrappers, postal cards, and other valu-
es forwarded by this Office to postmasters, are registered before they
transmitted through the mails. These packages are sent to every
t-office in the United States; and during the last fiscal year they
gregated 359,462, valued at $25,477,511.24. Of this large number
were lost, valued at $256.30. How many of these were destroyed
unavoidable casualties it is impossible to estimate. A number of
kages were missent, and by the aid of this system were traced, dis-
ered, and sent to their proper destination. If the system should be
lished, it would be impossible to transact our own business without
gely increasing the number and amount of losses from various causes.
During the year a plan for the exchange of registered pouches be-
een important distributing offices has been adopted. In these
uches all letters mailed to the exchange office are inclosed, accom-
nied by a letter-bill, showing the number of each package, and a
eipt given for the pouch obviates the necessity of receipting for each
ckage separately, thereby saving a great deal of time and trouble to
stal-car clerks and others, who are the proper custodians thereof
hile in transit. These pouches have been placed on the through lines
tween Boston and New Orleans, and New York and San Francisco,
cluding in the scheme all important intermediate post-offices. Sufficient
me has not elapsed since its inauguration to fully demonstrate all the
nefits to be derived from it; but enough is known to warrant me in
ying that it is no longer an experiment, but a very successful enter-
ise, and should be extended as rapidly as circumstances will admit.
New and distinctive pouches for this service have been adopted.
ey will be introduced at an early day; and as they will be handled
d guarded with especial care by those intrusted with their custody,
eater security will be afforded, and the celerity with which registered
ters are transmitted will be increased.
The lock now in use with the through registered pouches does not
lly meet the requirements of the service. Postmasters at the ex-
ange offices in which the present locks are used, so far as I am
vised on the subject, concur in this opinion. The adoption of a lock
ich could be opened only at terminal offices would save the unneces-
y labor caused by opening and verifying the contents of the pouches
transit, and would enable the Department to extend the system to
railway post-offices.
Much remains to be done in amending the law in regard to registered
ters, so as to simplify the system, in changing the regulations, and in
anging the details thereof, in order to perfect it and make it what it
uld be, an efficient adjunct of our postal service; and at an early
y I shall beg leave to call your attention to such changes and modi-
itions of the law as are deemed important.

DIVISION OF DEAD LETTERS.

The number and kinds of letters received and disposed of in this
ision during the year, and the value and description of their contents,
fairly shown by tables Nos. 11, 12, and 13, submitted herewith for
ir consideration, and may be thus epitomized:
Ordinary mail letters received, 2,416,112; drop or local, 488,600; of
nestic origin returned from foreign countries, 106,237; returned from
els, 31,240; held for postage, 318,604; misdirected, 61,252; without

address, 5,963; ship, 2,412; registered, 5,857; foreign, 210,377; and 516,493 ordinary mail and drop letters which were remaining on hand at the close of the last fiscal year, making a total of 4,163,147.

Of those opened, 31,779 were found to contain $61,769.14 in current funds; 14,225 contained drafts, notes, bills of exchange, &c., to the nominal value of $2,997,847.53; 135,027 contained jewelry, samples of merchandise, photographs, postage and revenue stamps, receipts, bills of lading, and specimens and souvenirs in almost infinite variety, from a living rattlesnake to a tress of hair; and 3,740,161 proved to contain nothing of value.

The disposition of letters containing valuable inclosures is as follows: 154,918 delivered to the proper owners, 33,423 filed for reclamation, and 10,536 are outstanding in the hands of postmasters for delivery. Of the 3,740,161 without inclosures, 1,339,248 were delivered to the writer or person addressed, and the remainder destroyed, either because they were obviously worthless, such as printed circulars and advertisements, or did not contain the name and address of the writer. Table No. 13 is more particularly interesting when considered in connection with what I have said concerning the division of registered letters, since it illustrates the value of that system by showing that of the 5,942 registered letters that reached the dead-letter division 5,556 were delivered to the owners, 321 filed for reclamation, and at least 50 of the 65 which are reported as outstanding in the hands of postmasters July 1, 1875, will probably yet be delivered.

The causes which operate to prevent the delivery of prepaid letters have been frequently stated by my predecessors, and may be briefly mentioned here. The indorsements made by postmasters as follows—"misdirected," "illegible," "dead"—explain the non-delivery of a large number, while the migratory habits of many of our own citizens, and the thousands of emigrants who arrive annually and move about from place to place seeking homes, and either fail to give their proper address when writing to their native land, or remove to a remote locality before their correspondence is received, will account for the balance. In this connection it may be interesting to state that of the 12,500,000 letters mailed to foreign countries but 106,200 have been returned unclaimed, while there have been returned to the country of origin 214,109 letters which became "dead" in this country of the 11,800,000 received.

The nearly uniform number of "held-for-postage" letters received since the enforcement of the law requiring prepayment of postage, indicates that the cause of failure to prepay at least one full rate is inadvertence, and not a willful intention to force the addressee to pay it, or to defraud the Department of its revenues. Prior to April 1, 1875, the practice was to open all such letters, and then return them to the writer if possible; otherwise, to notify the addressee that, upon the receipt of the amount of postage due, the letter would be forwarded; but since that date the seal has been respected, and the person addressed immediately invited to remit the postage, upon the receipt of which the letter is stamped and duly mailed in its original envelope.

This latter custom has given such general satisfaction during the three months it has been in operation, as compared with the old system, that the change in the treatment of this important class of letters seems amply justified. As the contents of these letters are always proportionately more valuable than those of any other class, the fact that they were not opened during one-fourth of the year will account for the apparent reduction in the number of valuable letters received, as compared with previous reports.

The usual regular and certain delivery of letters, instead of making ı occasional failure more tolerable, seems to only magnify the loss or ake it more grievous; but there has been a gratifying diminution in ıe number of applications for missing letters, there having been but 428 received, as against 6,420 last year, and complaints of the mis-eatment of mail-matter in about the same ratio of reduction.

I regret that the statistics of the Department do not show the number ' letters mailed annually, so that a comparison might be made between ıe number delivered and lost, which, I am sure, would be very credit-ɔle to the intelligence and fidelity of the employés of the postal service; ıd I take this opportunity to recommend that some system be adopted y which the number of letters mailed each year shall be ascertained, ıd the value of the statistics of the Department thus materially ıcreased.

During the past year the records of letters received have been ampli-ed and their miscellaneous contents more thoroughly classified, so that l desirable information as to details can be readily given.

The improvement in the management and execution of the duties of ıis important branch of the service, referred to in my last annual ·port, having continued, this division, which is composed of 29 gentle-ıen and 59 ladies, has become, in its *personnel*, a model of industry and unctuality.

DIVISION OF FILES, RECORDS, AND MAILS.

The number of official letters received and disposed of by this divis-·n during the year amounted to 685,000.

Of the number received, 26,500 were briefed, recorded, and, after being ·ted upon, filed; and 6,500 letters written in the Bureau were copied, ıveloped, and stamped for mailing. The number of employés engaged ı this division is only four; and when the fact is taken into considera-on that three of them were engaged a portion of the time on other uties, it will be seen that the amount of work done in proportion to ıe number employed has been very large.

NEWSPAPER AND PERIODICAL POSTAGE AND STAMPS.

On the first day of January, 1875, the new law requiring prepayment ' postage by stamps on all newspapers and periodicals sent from a nown office of publication to regular subscribers through the mails ent into operation. The system inaugurated to carry the law into effect as approved by you in October, 1874, and has been found by experi-nce to be admirably adapted to the purpose for which it was devised. ·o complaints of abuses on the part of publishers or postmasters have ·een received at this Office during the nine months that have elapsed ince the law went into effect. Indeed, it has worked so well in all its letails, and has given such general satisfaction, that the idea of return-ng to the old system, or materially modifying the new one, ought not o be entertained.

Previous to the time when this law began to operate, no stamps were ·quired for the payment of postage on newspapers sent to regular sub-·cribers, as the postage was collected in money quarterly at the office of elivery. Last year there were 35,000 post-offices at which newspaper-ostage was collected, while under the present true system, of the abso-ıte prepayment of all postages, the whole amount is collected at about 400 offices, the latter representing the number of places in the United tates at which newspapers and periodicals are mailed.

The papers for subscribers living outside of the county in which they are published are made up in bulk at the publication-office, carried to the post-office, and there weighed. The postage is computed on the whole issue, the proper amount in stamps handed to the postmaster, who gives the publisher a receipt as evidence of payment, and on the stubs of the receipt-book he affixes and cancels the stamps, which correspond in value with the sum mentioned in the receipt. Thus, one transaction is all that is required in paying the postage upon a single issue of any regular publication. The stubs with their canceled stamps are kept in the post-office as vouchers for the postage paid. In no case are the stamps affixed to the papers or packages that pass through the mails.

These stamps are twenty-four in number, and were prepared by the Continental Bank-Note Company of New York, from designs selected in October, 1874. The denominations are as follows, viz: 2 cents, 3 cents, 4 cents, 6 cents, 8 cents, 9 cents, 10 cents, 12 cents, 24 cents, 36 cents, 48 cents, 60 cents, 72 cents, 84 cents, 96 cents, $1.92, $3, $6, $9, $12, $24, $36, $48, and $60. These denominations were found to be necessary, in order that payment might be made on any given quantity, from one pound to one ton, at both the two and three cent rate, with the use of not to exceed five stamps in any transaction.

No description of these stamps having been given in any official form, I may be pardoned for presenting herewith a detailed description of them, in order that it may be printed and be permanently preserved in the records of the Department.

Two-cent to ten-cent, inclusive.—Emblematical figure of America, looking to the right, and modeled after Crawford's statue surmounting the dome of the Capitol. The left hand rests on a shield, and holds a wreath; the right rests on a sword. The head is adorned with a head-dress consisting of a coronet of stars, surmounted by an eagle's head and plumes. The vignette stands in an arched frame; and on either side of this frame, and at the top, are slabs, containing the inscriptions: "Newspapers," "Periodicals," "U. S. Postage." At the bottom are shaded letters representing the value, which is also indicated by large figures in the upper corners. The lower corners are ornamented with shields. The color of these stamps is black.

Twelve-cent to ninety six-cent, inclusive.—Vignette of Astræa, or Justice, in niche, curved at the top, holding in her right hand the balance, and resting with her left on a shield bearing the United States coat of arms. The figure is full-robed, mailed and girdled as to the upper part, and helmeted. Surmounting the helmet is an eagle with outstretched wings. Figures representing values on shields in upper corners; values also in sunken letters below, richly ornamented. Inscriptions on sides and at top in shaded capitals on lined ground. Color, pink.

One-dollar-and-ninety-two-cent.—Vignette of Ceres, Goddess of Agriculture, in curved niche. She holds in her left hand an ear of corn, her right, holding a wreath, rests against the hip. The figure faces to the front, and is clad in full, flowing robes. "U. S. Postage" at the top other inscriptions in italic capitals on obelisks at either side, resting on lower slab, containing value in white capitals. Value also in figures in upper corners. Color, deep brown.

Three-dollar.—Goddess of Victory, in curved niche, full-robed, girded, with sword to the left, and mantle thrown over shoulders. The right hand is stretched forward, holding a wreath; the left rests on a shield. Figures of value in upper corners; value below in letters on either side of a large figure 3. Inscriptions in solid labels on either side and on lined ground above. Color, vermilion.

Six-dollar.—Clio, the Muse of History, in curved niche, full-robed, the ga thrown over the left shoulder. In her right hand she holds a sty- s; in the left, a tablet. Figures of value n upper corners, surrounded ; curved ornaments. Inscriptions in white-shaded letters on side, and ove in dark letters on lined ground. Color, light blue.

Nine-dollar.—Minerva, the Goddess of Wisdom, full-robed, in curved che. The left hand is placed across her breast, holding a portion of r toga; the right is grasping a spear. Figures of value in upper cor- rs. Inscriptions on sides in shaded italics, and above in small letters lined ground. Value also in letters below on scroll. Beneath is a rge 9, in curved ornaments. Color, orange.

Twelve-dollar.—Vesta, the Goddess of the Fireside, full-robed, in rved niche. The left hand lifts her drapery; the right holds a burn- g lamp. Figures of value in upper corners on tablets; value also in tters on beaded frame beneath. Inscriptions in solid italic letters on des, and in small white letters above. Color, rich green.

Twenty-four-dollar.—Goddess of Peace, in curved niche, a half-naked gure, leaning against a broken column. She holds in her right hand an live-branch, while the right grasps three arrows. The value is in words eneath on a solid tablet; also in figures in ornamented curves in upper orners. Inscriptions in white shaded letters above and on sides, be- ween which latter and each upper corner is a large six-pointed star. olor, purplish-slate.

Thirty-six-dollar.—Figure representing Commerce, in full garments, in rved niche. She holds in her left hand the *caduceus*, the winged rod f Mercury; in her right, a miniature ship. Figures of value in upper orners, and in ornamented capitals below. Inscriptions, also in orna- ented capitals, on sides and above. Color, dull-red.

Forty-eight-dollar.—Hebe, the Goddess of Youth, partly-draped, in rved niche. The right hand holds a cup, which she is offering to the gle, around whose neck is thrown her left arm. Figures of value on ields in upper corners, the word "Postage" between; value also in tters below in curved ornaments. The letters "U. S." in circles be- veen upper corners and side inscriptions, the latter being in curved bels. Color, light-brown.

Sixty-dollar.—Vignette of an Indian maiden, standing in a rectangular ame. She is robed from her waist downward. Her right arm is tended, while her left hangs by her side. The background is a land ape, trees and vines to the left, and wigwams to the right in the dis- nce. Figures of value on shields in upper corne s; value also in white tters on solid tablets below. Inscriptions in white on solid labels ove and on sides. Color, rich purple.

NEW STAMP FOR FOREIGN POSTAGE, ETC.

To meet the new letter-rate of foreign postage under the treaty of erne, postage-stamps of the denomination of five cents began to be sued on the 21st of June last, and also stamped envelopes of that enomination.

The stamp is designed from a bust of Gen. Zachary Taylor, in full- ce, and is printed in dark-blue color. On the envelope the color is e same, but the bust is in profile.

The seven, twelve, and twenty-four-cent stamps, being no longer of y practical use, were at the same time discontinued; and the two-cent amp has been changed in color from brown to vermilion. A change s also been made in the color of third-quality stamped envelopes

from amber to blue; and an entirely new size of envelope, styled "No. 4½, commercial," being demanded by public convenience, has been added to the current series.

Very respectfully, &c.,

EDWARD W. BARBER,
Third Assistant Postmaster-General.

Hon. MARSHALL JEWELL,
Postmaster-General.

No. 2.—*Statement of payments made under sundry heads, charged to miscellaneous account for fiscal year ended June 30, 1875.*

For allowances to postmasters for office-repairs, gas-fixtures, telegraphing, and miscellaneous items	$95,907 91
For stationery in post-offices	38,623 58
For preparation and publication of post-route maps	30,357 91
For post-office envelopes	20,754 23
For registered-package envelopes	37,168 50
For official stamped envelopes	1,838 51
For publication of postal guides	19,674 35
For fees to United States marshals	1,014 65
For fees to attorneys	3,000 00
For fees to clerks of courts	1,328 67
For moieties to informers in cases of violation of postal laws	1,200 00
For law-books for use of the Post-Office Department	1,288 21
For engraving, printing, and binding drafts and warrants	543 30
For postal expenses of United States consuls	594 94
For miscellaneous items	582 81
	253,877 57

EDWARD W. BARBER,
Third Assistant Postmaster-General.

No. 3.—*Estimate of indebtedness of the Post-Office Department for fiscal year ended June 30, 1875, not yet adjusted.*

Balances due foreign countries		$93,815 47
Mail-service under contract or recognized, but not yet reported for payment		672,755 14
Mail-service unrecognized:		
Fiscal year ended June 30, 1874	$29,081 76	
Fiscal year ended June 30, 1875	733,408 03	
		762,489 79
		1,529,060 40

EDWARD W. BARBER,
Third Assistant Postmaster-General.

No. 4.—*Statement exhibiting receipts and expenditures under appropriate heads, by quarter[illegible] and Ju[illegible]e*

RECEIPTS.

	Quarter ended September 30, 1874.	Quarter ended December 31, 1874.	Quarter ended March 31, 1875.	Quarter ende[illegible] June 30, 1875.
Letter-postage	$71, 199 75	$64, 521 38	$82, 865 71	$68, 382 [illegible]
Postage on printed matter	293, 472 61	284, 296 07	1, 504 85	91 [illegible]
Emoluments	316, 173 81	313, 530 23	320, 201 35	320, 648 [illegible]
Fines	439 54	1, 457 25	9, 190 38	3, 199
Stamps, stamped envelopes, and postal cards	5, 431, 944 82	6, 173, 164 97	6, 381, 028 42	6, 504, 804
Dead-letters	1, 430 00	900 00	6, 850 00	.....
Miscellaneous	3, 386 02	3, 248 23	3, 980 60	9, 306
Revenue from money-order business	.....	.....	.....	120, 142
Total	6, 118, 046 55	6, 841, 118 13	6, 805, 621 31	7, 026, 574

Comparison, including revenue from money-order business and official postage-stamps:
Increase of receipts over year ended June 30, 1874, $314,288.77, or 1.18 + per cent.
Increase of receipts over year ended June 30, 1873, $3,794,619.02, or 16.5 + per cent.

EXPENDITURES.

Compensation to postmasters	$1, 692, 439 33	$1, 806, 752 89	$1, 786 944 51	$1, 763, 799 01
Compensation to postmasters for previous years, act March 3, 1875	.....	.....	295, 688 44	2, 498 29
Ship, steamboat, and way letters	1, 175 18	908 15	668 15	1, 061 [illegible]
Transportation of the mails	4, 417, 807 21	4, 949, 643 71	4, 743, 587 26	4, 666, 163 02
Wrapping-paper	1, 460 00	1, 908 22	5, 238 88	2, 960 00
Office-furniture	2, 041 81	4, 345 88	4, 464 24	6, 012 3[illegible]
Advertising	62, 122 83	88, 486 16	13, 008 44	4, 763 77
Mail-bags and catchers	60, 451 06	57, 931 18	45, 317 84	23, 448 00
Postmarking and canceling stamps	1, 044 86	1, 051 31	2, 315 98	1, 531 08
Mail locks and keys	10, 282 03	9, 247 65	2, 759 40	9, 522 34
Mail depredations and special agents	39, 282 00	35, 673 78	38, 138 91	37, 599 08
Clerks for post-offices	839, 077 37	843, 827 38	842, 513 27	889, 393 24
Postage-stamps, stamped envelopes, and postal cards	154, 725 00	234, 480 33	161, 240 25	173, 741 26
Letter-carriers	455, 210 61	469, 787 74	473, 928 87	480, 2[illegible]2 [illegible]
Dead-letters	1, 760 00	.....	.....	552 42
Twine	9, 964 50	12, 043 07	12, 354 50	9, 449 50
Letter-balances	1, 244 00	16, 303 15	215 65	1, 686 44
Rent, light, and fuel	84, 487 54	103, 339 64	93, 285 17	108, 526 50
Miscellaneous:				
Stationery	7, 855 33	7, 226 03	10, 722 08	13, 624 17
Post-route maps	8, 708 01	7, 556 27	7, 723 56	6, 370 07
Postal Guides	6, 450 00	.....	.....	.....
Miscellaneous	40, 087 89	77, 126 57	36, 636 99	24, 583 08
Balances due foreign countries:				
Denmark	667 59	478 05	624 10	.....
German Empire	16, 820 75	.....	16, 385 48	31, 412 34
Great Britain	32, 426 52	10, 006 85	6, 382 75	7, 163 64
Norway	981 15	1, 773 43	6, 383 83	.....
Sweden	4, 712 06	5, 537 09	4, 294 97	5, 671 31
Belgium	2, 395 41	2, 475 88	2, 427 16	2, 595 04
Empire of France	.....	.....	.....	20, 117 12
Total	7, 955, 680 04	8, 747, 910 41	8, 613, 250 71	8, 294, 468 29

Comparison:
Increase of expenditures over year ended June 30, 1874, $1,484,894.87, or 4.6 + per cent.
Increase of expenditures over year ended June 30, 1873, $4,545,598.93, or 15.6 + per cent.

scal year ended June 30, 1875, *compared with fiscal years ended June* 30, 1874,

RECEIPTS.

ar ine .	Aggregate for comparison.	Total year ended June 30, 1874.	Compared with year ended June 30, 1874.		Total year ended June 30, 1873.	Compared with year ended June 30, 1873.	
			Increase.	Decrease.		Increase.	Decrease.
04	.....	$326, 295 25	.....	$39, 326 21	$348, 849 49	.....	$61, 880 45
45	.....	1, 392, 374 06	.....	813, 009 11	1, 072, 998 19	.....	493, 633 24
23	.....	1, 226, 925 85	$43, 628 38	.....	1, 150, 042 38	$120, 511 85	.....
29	.....	10, 711 12	3, 575 17	.....	3, 917 39	10, 368 90	.....
23	.....	23, 388, 722 20	1, 102, 290 03	.....	20, 324, 817 50	4, 166, 124 73	.....
00	.....	8, 721 00	459 00	.....	6, 208 00	2, 972 00	.....
76	.....	18, 124 22	1, 797 54	.....	21, 324 62	.....	1, 402 86
09	.....	105, 198 12	14, 943 97	.....	68, 584 00	51, 558 09	.....
59	.....	26, 477, 071 82	1, 166, 624 09	852, 335 32	22, 996, 741 57	4, 351, 535 57	556, 916 55
82	.....	.....	852, 335 32	.....	26, 791, 360 59	556, 916 55	.....
77	.....	.....	314, 288 77	.....	3, 794, 619 02	3, 794, 619 02	.....

n, excluding revenue from money-order business and official postage-stamps:
crease of receipts over year ended June 30, 1874, $1,060,364.31, or 4.3 + per cent.
crease of receipts over year ended June 30, 1873, $3,788,317.84, or 17.3 + per cent.

EXPENDITURES.

77	.....	$5, 818, 472 17	$1,231,463 60	.....	$5, 725, 468 12	$1,324,467 65	.....
33	.....	.....	298, 187 33	.....	.....	298, 187 33	.....
18	.....	4, 188 42	.....	$435 24	4, 257 96	.....	$504 78
20	.....	18, 881, 319 05	.....	104, 117 85	16, 833, 682 58	1, 943, 518 62	.....
10	.....	20, 200 00	.....	8, 632 90	23, 494 49	.....	11, 927 39
31	.....	32, 711 90	.....	15, 847 59	6, 368 57	10, 495 74	.....
20	.....	109, 740 68	58, 640 52	.....	81, 412 60	86, 968 60	.....
08	.....	212, 714 76	.....	25, 566 68	170, 227 20	16, 920 88	.....
23, 42	$37,754 65	48, 097 25	.....	10, 342 60	38, 377 30	.....	622 65
77	.....	165, 478 63	.....	14, 784 86	157, 963 26	.....	7, 269 49
26	.....	3, 297, 961 77	116, 849 49	.....	2, 978, 614 24	436, 197 02	.....
84	.....	845, 196 08	.....	121, 009 24	653, 921 76	70, 265 08	.....
11	.....	1, 802, 418 68	76, 791 43	.....	1, 422, 990 69	456, 219 42	.....
42	.....	5, 983 89	.....	3, 671 47	.....	2, 312 42	.....
57, 24, 85, 61, 91, 00, 53	707,569 71	677, 046 35	30, 523 36	.....	669, 890 70	37, 679 01	.....
74	.....	1, 855 88	.....	86 14	3, 681 45	.....	1, 911 71
57	.....	91, 237 88	.....	26, 619 31	238, 869 29	.....	174, 250 72
76	.....	85, 505 53	.....	29, 525 77	44, 957 18	11, 022 58	.....
41	.....	.....	9, 138 41	.....	.....	9, 138 41	.....
43	.....	16, 777 24	3, 438 19	.....	.....	20, 215 43	.....
49	.....	9, 508 42	385 07	.....	11, 533 13	.....	1, 639 64
12	.....	.....	20, 117 12	.....	.....	20, 117 12	.....
45	.....	32, 126, 414 58	1, 845, 534 52	360, 639 65	29, 065, 710 52	4, 743, 725 31	198, 126 38
58	.....	.....	360, 639 65	.....	33, 611, 309 45	198, 126 38	.....
87	.....	.....	1, 484, 894 87	.....	4, 545, 598 93	4, 545, 598 93	.....

EDWARD W. BARBER,
Third Assistant Postmaster-General.

No. 5.—*Receipts and disbursements at Treasury*

Depositories.	Deposits.	Grants from Treasury.	By transfer.	Aggregate accumulation.	Aggregate receipts.
Treasurer U. S., Washington, D. C.	$336,555 10	$23,543 00	$364,814 40	$724,912 50	$360,098 10
Asst. treasurer U. S., Baltimore, Md	152,538 00		150,000 00	302,538 00	152,538 00
Asst. treasurer U. S., Boston, Mass.	585,774 20		75,000 00	660,774 20	585,774 20
Asst. treasurer U. S., Charleston, S. C.	35,786 81		300,000 00	335,786 81	35,786 81
Asst. treasurer U. S., Chicago, Ill	58,715 77		1,175,000 00	1,233,715 77	58,715 77
Asst. treasurer U. S., Cincinnati, Ohio	320,766 77		150,000 00	470,766 77	320,766 77
Asst. treasurer U. S., New Orleans, La	63,866 84		450,000 00	513,866 84	63,866 84
Asst. treasurer U. S., New York, N. Y.	2,228,909 15	7,876,991 80	50,000 00	10,155,900 95	10,105,900 95
Asst. treasurer U. S., Philadelphia, Pa	507,672 35		50,000 00	557,672 35	507,672 35
Asst. treasurer U. S., San Francisco, Cal	388,901 85			388,901 85	388,901 85
Asst. treasurer U. S., Saint Louis, Mo	86,445 19		925,000 00	1,011,445 19	86,445 19
Designated depository, Buffalo, N. Y.	1,362 96			1,362 96	1,362 96
Designated depository, Pittsburgh, Pa	923 75			923 75	923 75
Designated depository, Santa Fé, N. Mex	737 40			737 40	737 40
First Nat'l Bank, Cincinnati, Ohio					
First Nat'l Bank, Denver, Colo	1,188 52			1,188 52	1,188 52
First Nat'l Bank, Galveston, Tex	2,939 50			2,939 50	2,939 50
First Nat'l Bank, Leavenworth, Kans					
First Nat'l Bank, Memphis, Tenn	2,962 64			2,962 64	2,962 64
First Nat'l Bank, Milwaukee, Wis					
First Nat'l Bank, Nashville, Tenn	1,958 45			1,958 45	1,958 45
First Nat'l Bank, Portland, Oreg	211 14			211 14	211 14
First Nat'l Bank, Providence, R. I.	561 60			561 60	561 60
First Nat'l Bank, Springfield, Ill	529 13			529 13	529 13
First Nat'l Bank, Saint Paul, Minn	119 65			119 65	119 65
First Nat'l Bank, Trenton, N. J	1,221 27			1,221 27	1,221 27
First Nat'l Bank, Yankton, Dak	702 23			702 23	702 23
Second Nat'l Bank, Detroit, Mich	325 00			325 00	325 00
Second Nat'l Bank, New Haven, Conn	349 60			349 60	349 60
Second Nat'l Bank, Utica, N. Y.					
Merchants' N'l Bank, Cleveland, Ohio	218 49			218 49	218 49
Merchants' N'l Bank, Little Rock, Ark	33 25			33 25	33 25
Merchants' N'l Bank, Portland, Me	1 00			1 00	1 00
Merchants' N'l Bank, Savannah, Ga	21,787 84			21,787 84	21,787 84
Atlanta Nat'l Bank, Atlanta, Ga	396 70			396 70	396 70
Charter Oak N'l Bank, Hartford, Conn	512 60			512 60	512 60
City Nat'l Bank, Grand Rapids, Mich					
Exchange Nat'l Bank, Norfolk, Va	16 95			16 95	16 95
Indianapolis N'l B'k, Indianapolis, Ind	934 83			934 83	934 83
German Nat'l Bank, Memphis, Tenn	1,423 60			1,423 60	1,423 60
Lynchburgh N'l Bank, Lynchburgh, Va					
Nat'l Exchange Bank, Milwaukee, Wis	50 00			50 00	50 00
Omaha Nat'l Bank, Omaha, Nebr					
Raleigh Nat'l Bank, Raleigh, N. C	1,903 94			1,903 94	1,903 94
San Antonio N'l B'k, San Antonio, Tex	88 85			88 85	88 85
Total	4,809,392 92	7,900,534 80	3,689,814 40	16,399,742 12	12,709,927 72

Comparative statement between fiscal years

Deposits for fiscal year of 1874		$5,551,966 67
Deposits for fiscal year of 1875		4,809,392 92
Decrease in deposits for 1875		742,573 75
Grants from the Treasury for 1875	$7,900,534 80	
Grants from the Treasury for 1874	6,439,044 71	
	1,461,490 09	
Aggregate receipts for 1875		12,709,927 72
Aggregate receipts for 1874		11,991,011 38
		718,916 34
Increase of receipts for 1875		1,071,282 66
Deduct decrease of receipts for 1875		352,366 32
		718,916 34
Increase of grants from Treasury for 1875		1,461,490 09
Deduct increase of aggregate receipts for 1875		718,916 34
Decrease for 1875, as shown above		742,573 75

ies during the fiscal year ended June 30, 1875.

of i.	Decrease of receipts from 1874.	Warrants drawn.	Increase over 1874.	Decrease from 1874.	Transfer account. From—	Transfer account. To—	Balance subject to draft June 30, 1875.
..	$96, 920 65	$818, 137 70	.....	$66, 659 96	.....	$364, 814 40	$47, 588 31
.	1, 677 83	292, 022 90	.....	103, 926 11	.....	150, 000 00	59, 593 07
66	.....	597, 644 10	$359, 351 58	.....	$15, 000 00	75, 000 00	77, 122 21
..	5, 507 48	335, 046 18	62, 414 67	.....	.....	300, 000 00	21, 057 43
..	126, 759 61	1, 260, 904 16	298, 794 85	.....	.....	1, 175, 000 00	16, 312 08
93	.....	391, 034 20	.....	3, 933 61	.....	150, 000 00	125, 170 10
.	42, 970 46	496, 758 94	14, 675 25	.....	.....	450, 000 00	32, 278 57
62	.....	5, 848, 971 29	.....	368, 285 53	3, 575, 000 00	50, 000 00	807, 865 34
..	4, 837 14	453, 935 69	.....	113, 633 99	50, 000 00	50, 000 00	142, 208 92
02	.....	352, 314 50	5, 053 20	.....	.....	.....	84, 875 08
..	40, 985 98	1, 007, 819 94	210, 751 91	.....	.....	925, 000 00	6, 027 33
..	2, 457 04	.....	.....	.....	1, 712 96	.....	350 00
26	.....	.....	.....	.....	1, 296 23	.....	.....
40	.....	.....	.....	.....	447 40	.....	290 00
.	505 95	.....	.....	.....	.....	.....	.....
52	.....	.....	.....	.....	1, 188 52	.....	.....
06	.....	.....	.....	.....	2, 588 37	.....	351 13
.	2, 162 46	.....	.....	.....	.....	.....	.....
29	.....	.....	.....	.....	530 62	.....	2, 432 02
..	151 00	.....	.....	.....	.....	.....	.....
14	.....	.....	.....	.....	558 41	.....	1, 513 35
.	280 59	.....	.....	.....	342 48	.....	20 25
60	.....	.....	.....	.....	561 60	.....	.....
.	4, 760 52	.....	.....	.....	5, 082 80	.....	435 98
.	112 45	.....	.....	.....	351 75	.....	.....
27	.....	.....	.....	.....	1, 221 27	.....	.....
23	.....	.....	.....	.....	702 23	.....	.....
00	.....	.....	.....	.....	.....	.....	325 00
60	.....	.....	.....	.....	1, 680 19	.....	.....
..	352 35	.....	.....	.....	.....	.....	.....
..	915 90	.....	.....	.....	320 99	.....	.....
.	437 47	.....	.....	.....	.....	.....	33 25
00	.....	.....	.....	.....	.....	.....	1 00
..	9, 822 29	.....	.....	.....	26, 937 84	.....	.....
.	641 31	.....	.....	.....	514 89	.....	.....
60	.....	.....	.....	.....	512 60	.....	.....
.	956 44	.....	.....	.....	.....	.....	.....
95	.....	.....	.....	.....	16 95	.....	.....
.	1, 490 13	.....	.....	.....	534 73	.....	523 10
60	.....	.....	.....	.....	107 50	.....	1, 316 10
..	116 25	.....	.....	.....	116 25	.....	.....
00	.....	.....	.....	.....	50 00	.....	.....
.	7, 150 43	.....	.....	.....	.....	.....	.....
91	.....	.....	.....	.....	2, 348 97	.....	.....
..	194 59	.....	.....	.....	88 85	.....	.....
66	352, 366 32	11, 854, 589 60	951, 041 46	656, 439 20	3, 689, 814 40	3, 689, 814 40	1, 427, 689 62

and 1875 at Treasury depositories.

drawn for 1875	$11, 854, 589 60	
drawn for 1874	11, 559, 987 34	
f warrants for 1875		$951, 041 46
crease of warrants for 1875		656, 439 20
ease for 1875	294, 602 26	294, 602 26
ubject to draft June 30, 1875		1, 427, 689 62
ubject to draft June 30, 1874		586, 135 61
ease for 1875		841, 554 01
ber of warrants issued during fiscal year 1875		12, 278
ber of warrants issued during fiscal year 1874		10, 649
ease for 1875		1, 629

EDWARD W. BARBER,
Third Assistant Postmaster-General.

No. 6.—*Receipts and disbursements at depository post-offices on account fiscal year ended June 30, 1875.*

Offices.	State.	Proceeds.	Deposits.	Collections.	Aggregate accumulation.	Amount subject to draft June 30, 1874.	Credit-balance June 30, 1874.	Total.	Disbursements.	Amount subject to draft June 30, 1875.	Credit-balance June 30, 1875.
Adrian	Michigan	$6,060 09	$457 01		$6,517 10	$1,011 23		$7,528 33	$5,416 56	$2,111 77	
Augusta	Maine	15,555 71	1,378 97	$402 80	17,337 48	1,998 60		19,336 08	15,917 52	3,418·56	
Auburn	New York	18,843 76	449 51	107 14	19,400 41	5,898 55		25,298 96	19,669 91	5,629 05	
Albia	Iowa	1,603 52	1,083 91		2,687 43	388 32		3,075 75	2,626 02	449 73	
Augusta*	Georgia	16,229 12	273 13	310 69	16,812 94	1,417 95		18,230 89	18,230 89		
Austin	Texas	13,318 17	12,721 76	4,575 46	30,615 39	2,524 85		33,140 24	32,427 21	713 03	
Albany	New York	83,315 85	37,927 31	54 32	121,297 48	26,329 44		147,626 92	130,228 62	17,398 30	
Atlanta	Georgia	29,646 20	6,907 72	8,691 61	45,245 53	549 61		45,795 14	45,796 36		$1 22
Bay City	Michigan	7,076 95	2,351 34	1,588 60	11,016 89	1,852 59		12,869 48	11,094 24	1,775 24	
Burlington*	Iowa	14,259 44	52 98	624 05	14,936 47	1,166 46		16,102 93	16,102 93		
Bangor	Maine	16,240 19	6,402 87	73 84	22,716 90	2,421 20		25,138 10	24,229 24	908 86	
Binghamton	New York	16,465 21	11,295 17	1 22	27,761 60	7,726 38		35,487 98	32,656 04	2,831 94	
Batavia	....do	4,422 77	270 71	68 02	4,761 50	3,030 60		7,792 10	6,412 89	1,379 21	
Buffalo*	....do	79,131 01	6,344 21	24 18	85,499 40	6,680 03		92,179 43	92,179 43		
Brattleborough*	Vermont	5,835 24		55 92	5,891 16	1,458 07		7,349 23	5,196 17	2,153 06	
Burlington	....do	12,316 86		116 74	12,433 60	7,074 70		19,508 30	18,251 44	1,256 86	
Bellefonte*	Pennsylvania	2,606 52	18 52	1,244 73	3,869 77	2,210 67		6,080 44	6,080 44		
Cooperstown*	New York	2,417 74	117 03	725 29	3,260 06	1,615 87		4,875 93	4,887 76		11 83
Charleston	Illinois	3,048 52	350 30	148 50	3,547 32	423 81		3,971 13	2,920 81	1,050 32	
Cleveland	Ohio	141,670 82	14,892 00	699 38	157,262 20	30,567 63		187,829 83	170,574 34	17,255 49	
Columbus	....do	39,051 21	7,117 45	100 00	46,268 66	11,432 58		57,701 24	55,397 31	2,303 93	
Concord	New Hampshire	14,323 13	13,607 50	505 40	28,436 03	3,721 37		32,157 40	32,082 82	74 58	
Decorah	Iowa	2,858 06	371 78	32 42	3,262 26	2,414 81		5,677 07	5,137 52	539 55	
Denver	Colorado	20,026 18	7,277 03	4,629 31	31,932 52	147 05		32,079 57	30,554 46	1,525 11	
Davenport	Iowa	19,010 79	2,964 74	155 05	22,130 58		$91 90	22,038 68	22,166 03		127 35
Des Moines	....do	22,423 97	6,472 27	1 63	28,897 87	6,403 03		35,300 90	31,666 03	3,634 87	
Detroit	Michigan	151,049 20	6,373 16	584·11	158,006 47	17,317 67		175,324 14	159,688 24	15,635 90	
Dover*	Delaware	1,913 65	1,166 77	31 94	3,112 36	365 73		3,478 09	3,478 09		
Dubuque	Iowa	19,592 15	5,029 74	14 46	24,636 35	3,823 57		28,459 92	28,968 77		508 85
Elmira	New York	19,094 83	5,051 49	449 83	24,596 15	2,838 21		27,434 36	27,022 20	412 16	
Easton*	Pennsylvania	4,316 72	474 10		4,790 82		768 52	4,022 30	4,022 30		
Evansville*	Indiana	14,100 81	1,440 14	41 41	15,582 36	871 84		16,454 20	17,577 98		1,123 78
Farmington*	Maine	814 26	295 57		1,109 83	720 46		1,830 29	1,830 29		
Franklin*	Pennsylvania	2,450 23	4,085 29	11 25	6,546 77			6,546 77	6,546 77		
Fort Dodge	Iowa	2,501 42	752 66	59 11	3,313 19	448 21		3,761 40	3,619 72	141 68	
Fort Smith*	Arkansas	1,113 83	34,929 80	1,313 92	37,357 55	3,503 23		40,860 78	40,860 78		
Fort Wayne	Indiana	14,259 41	3,320 51	858 22	18,438 14	3,162 61		21,600 75	21,082 97	517 78	
Geneva*	New York	5,023 44	961 84		5,985 28	4,819 63		10,804 91	10,804 91		
Grand Rapids	Michigan	26,199 53	2,480 69	527 06	29,207 28	4,338 09		33,545 37	32,611 87	933 50	
Houghton	....do	1,311 28	3,307 10	4,308 32	8,926 70	3,605 02		12,531 72	9,567 45	2,964 27	
Houston	Texas	15,795 45	1,054 72	779 01	17,629 18	797 33		18,426 51	18,095 58	330 93	

* Changed to a deposit or a collection office during the fiscal year ended June 30, 1875.

Huntsville	Alabama	2,175 64	328 38	450 42	2,954 44	424 06		3,378 50	3,107 14	271 36	
Iowa City	Iowa	6,026 12	24 32		6,050 44	2,173 48		8,223 92	6,509 31	1,714 61	
Indianapolis	Indiana	69,431 61	1,678 89	1,131 56	72,242 06	3,499 49		75,741 55	73,896 02	1,845 53	
Jamestown	New York	7,014 00	2,419 05	553 19	9,986 24	3,564 72		13,550 96	11,560 76	1,990 20	
Jonesville*	Michigan	1,584 19	292 83	510 74	2,387 76	190 53		2,578 29	2,578 29		
Jacksonville	Florida	5,806 46	2,469 75	1,792 63	10,068 84	580 31		10,649 15	10,801 88		152 73
East Saginaw*	Michigan	9,518 69	1,069 50		10,588 19	700 42		11,288 61	10,947 13	341 48	
Keokuk	Iowa	12,967 64	1,056 31	215 55	14,239 50	2,024 31		16,263 81	14,195 98	2,067 83	
Kalamazoo	Michigan	10,753 31	2,477 52	3,528 52	16,759 35	1,902 87		18,662 22	13,128 52	5,533 70	
Keene	New Hampshire	5,842 81	1,664 88	1,895 81	9,403 50	827 82		10,231 32	9,792 38	438 94	
Knoxville	Tennessee	9,598 15	875 55	158 62	10,624 32	1,658 48		12,282 80	12,317 25		34 45
Lansing	Michigan	11,600 96	2,077 51	2,238 18	15,916 65	1,309 10		17,225 75	15,367 38	1,858 37	
La Fayette	Indiana	10,143 88	1,529 95	1,363 95	13,037 78	1,442 34		14,480 12	13,406 36	1,073 76	
Lancaster*	New Hampshire	516 66	503 54	826 88	1,842 08	1,468 45		3,310 53	3,310 53		
Leavenworth	Kansas	12,642 77	9,176 96	4,156 33	25,976 06	1,429 72		27,405 78	27,590 48		184 70
Lexington	Kentucky	11,345 67	1,092 96	279 14	12,717 77	3,446 54		16,164 31	15,157 40	1,006 91	
Lima	Ohio	3,849 76	4,011 58	14 23	7,875 57	613 13		8,488 70	4,487 62	4,001 08	
Louisville	Kentucky	117,934 23	4,658 51	808 21	123,400 95	9,158 65		132,559 60	130,119 00	2,440 60	
Lowell*	Massachusetts	23,739 43	547 64	2,552 38	26,839 45	2,092 89		28,932 34	28,932 34		
Malone	New York	2,079 77	78 71	1,254 90	3,413 38	1,573 04		4,986 42	3,658 75	1,327 67	
Marquette	Michigan	4,129 00	774 25	603 35	5,506 60			5,506 60	4,610 48	896 12	
McGregor*	Iowa	1,375 80	226 68		1,602 48	502 91		2,105 39	2,105 39		
Marengo*	do	996 69	25 77		1,022 46	758 53		1,780 99	1,780 99		
Marshalltown	do	5,562 50	1,229 81	125 40	6,917 71	813 72		7,731 43	7,848 11		116 68
Mt. Pleasant	do	2,774 48	50 38	1,327 81	4,152 67			4,152 67	2,348 57	1,804 10	
Montgomery	Alabama	7,341 48	3,680 38	2,710 13	13,731 99	372 76		14,104 75	13,882 91	221 84	
Madison	Wisconsin	14,786 97	1,440 91	61 27	16,289 15		740 38	15,548 77	15,902 02		353 25
Meadville	Pennsylvania	14,863 44	2,606 92	3,233 43	20,703 97		251 19	20,452 60	20,258 57	194 03	
Memphis	Tennessee	44,474 37	6,627 20	579 66	51,681 23	1,627 99		53,309 22	54,655 08		1,345 86
Milwaukee	Wisconsin	107,380 73	10,813 03	3 29	118,197 05	11,898 79		130,095 84	127,765 39	2,330 45	
Mobile	Alabama	27,492 18	3,812 55	282 46	31,587 19		1,474 58	30,112 61	30,285 28		172 67
Montpelier	Vermont	5,691 60	2,738 19	63 56	8,493 35	3,497 49		11,990 84	10,576 39	1,414 45	
New Bedford	Massachusetts	19,155 76	655 18		19,810 94			19,810 94	19,230 76	580 18	
Norwich*	Connecticut	10,413 61	1,159 92		11,573 53	9,391 29		20,964 82	20,964 82		
Norwich	New York	3,153 92	184 42		3,338 34	1,562 88		4,901 22	3,977 26	923 96	
Newton*	New Jersey	1,093 27	352 64		1,445 91	665 53		2,111 44	2,111 44		
Nashville	Tennessee	32,442 19	5,162 73	716 91	38,321 83	4,516 67		42,838 50	43,067 18		228 68
Newark	New Jersey	81,464 36	16,215 88	189 65	97,869 89	30,438 76		128,308 65	105,475 45	22,833 20	
New Haven	Connecticut	64,206 49	25,105 87	462 95	89,775 31	30,459 93		120,235 24	115,225 39	5,009 85	
Oskaloosa	Iowa	7,889 24	2,454 10	2,070 95	12,414 29	1,562 15		13,976 44	12,978 48	997 96	
Omaha	Nebraska	19,804 37	16,028 75	32,208 66	68,041 78	2,584 41		70,626 19	68,843 46	1,782 73	
Ogdensburgh	New York	5,863 83	3,464 58	56 12	9,385 53	2,554 89		11,939 42	11,550 98	388 44	
Olean	do	1,740 55	1,739 57	108 27	3,588 39	335 58		3,923 97	3,686 10	237 87	
Portsmouth	New Hampshire	6,182 61	3,974 47	439 51	10,596 59	740 06		11,336 65	9,592 75	1,743 90	
Pomeroy*	Ohio	423 24	52 06		475 30	1,386 85		1,862 15	1,862 15		
Paducah*	Kentucky	2,247 96	130 48	63 62	2,442 06	384 46		2,826 52	2,826 52		
Portsmouth	Ohio	6,125 94	8,294 44	3,647 49	18,067 87	1,071 67		19,139 54	18,582 49	557 05	
Providence	Rhode Island	104,142 36	31,063 58	541 10	135,747 04	33,967 07		169,714 11	163,110 30	6,603 81	
Peoria	Illinois	25,788 44	1,629 95	33 77	27,452 16	1,960 25		29,412 41	29,601 06		188 65
Pittsburgh	Pennsylvania	167,838 66	22,525 00	2,038 40	192,402 06	30,340 71		222,742 77	210,293 52	12,449 25	

No. 6.—*Receipts and disbursements at depository post-offices, &c.*—Continued.

Offices.	State.	Proceeds.	Deposits.	Collections.	Aggregate accumulation.	Amount subject to draft June 30, 1874.	Credit-balance June 30, 1874.	Total.	Disbursements.	Amount subject to draft June 30, 1875.	Credit-balance June 30, 1875.
Plattsburgh	New York	$3,700 19	$1,505 67	.....	$5,205 86	$1,463 17	.....	$6,669 03	$6,400 52	$268 51	.....
Portland	Maine	50,977 41	14,748 78	$295 65	66,021 84	9,886 89	.....	75,908 73	72,772 80	3,135 93	.....
Quincy*	Illinois	9,261 96	280 30	.....	9,542 26	1,080 85	.....	10,623 11	10,623 11	.....	.....
Rock Island*	...do	3,102 04	308 41	1,000 00	4,410 45	1,006 63	.....	5,417 08	5,417 08	.....	.....
Raleigh	North Carolina	11,265 80	2,968 09	970 33	15,204 22	1,118 99	.....	16,323 21	17,568 67	.....	$1,245 46
Richmond	Virginia	46,057 13	7,606 70	508 75	54,172 58	5,453 63	.....	59,626 21	56,510 54	3,115 67	.....
Ripon*	Wisconsin	1,272 84	123 31	.....	1,396 15	1,060 63	.....	2,456 78	2,456 78	.....	.....
Rutland	Vermont	5,673 74	4,404 40	3,053 58	13,131 72	89 05	.....	13,220 77	12,629 53	591 24	.....
Rochester	New York	95,777 06	8,033 80	1,280 19	105,091 05	15,990 33	.....	121,081 38	111,689 88	9,391 50	.....
Saint Albans	Vermont	4,462 08	218 16	.....	4,680 24	2,583 52	.....	7,263 76	5,260 43	2,003 33	.....
Saint Johnsbury	...do	3,775 91	1,710 37	130 54	5,616 82	1,065 07	.....	6,681 89	5,850 70	831 19	.....
Saint Paul	Minnesota	40,976 80	23,476 48	94 46	64,547 74	2,286 11	.....	66,833 85	66,985 67	.....	151 82
Sandusky	Ohio	6,090 95	4,932 50	.....	11,023 45	3,021 83	.....	14,045 28	13,257 07	788 21	.....
Savannah†	Georgia	6,588 96	9 94	.....	6,598 90	.....	.....	6,598 90	7,283 12	.....	684 22
Scranton	Pennsylvania	13,521 00	14,989 79	1,176 02	29,686 81	2,886 24	.....	32,573 05	32,402 25	170 80	.....
Springfield	Illinois	17,295 62	1,749 99	811 51	19,857 12	1,968 60	.....	21,825 72	21,037 53	788 19	.....
Springfield	Massachusetts	45,170 09	15,211 87	2,123 41	62,505 37	17,377 81	.....	79,883 18	74,384 13	5,499 05	.....
Steubenville	Ohio	5,198 07	2,269 15	117 10	7,584 32	2,902 24	.....	10,486 56	7,508 48	2,978 08	.....
Syracuse	New York	53,860 88	7,561 94	27 80	61,450 62	14,402 00	.....	75,852 62	68,758 44	7,094 18	.....
Taunton	Massachusetts	10,376 11	1,014 09	.....	11,390 20	2,914 04	.....	14,304 24	12,889 72	1,414 52	.....
Towanda	Pennsylvania	3,476 05	264 79	126 38	3,867 22	2,082 32	.....	5,949 54	5,221 01	728 53	.....
Toledo	Ohio	64,791 04	1,725 47	17,080 40	83,596 91	2,163 75	.....	85,760 66	84,029 71	1,730 95	.....
Terre Haute	Indiana	14,973 89	1,709 98	49 32	16,733 19	.....	.....	16,733 19	15,226 65	1,506 54	.....
Urbana	Ohio	5,307 88	2,489 67	.....	7,797 55	3,985 17	.....	11,782 72	10,843 26	939 46	.....
Utica	New York	39,629 13	5,347 15	53 94	45,030 22	11,853 91	.....	56,884 13	41,659 49	15,224 64	.....
Vincennes*	Indiana	1,690 47	840 62	.....	2,531 09	587 29	.....	3,118 38	3,118 38	.....	.....
Watertown	New York	15,007 78	122 38	4,951 66	20,081 82	1,183 99	.....	21,265 81	18,968 41	2,297 40	.....
Wellsborough	Pennsylvania	1,245 04	890 72	26 05	2,161 81	1,619 00	.....	3,780 81	2,679 93	1,100 88	.....
Washington	Iowa	1,722 08	9 05	112 64	1,843 77	845 04	.....	2,688 81	2,688 81	.....	.....
Winona	Minnesota	7,170 83	4,640 30	194 91	12,006 04	1,493 93	.....	13,499 97	12,801 66	698 31	.....
Wilmington*	North Carolina	9,156 75	515 01	2,243 44	11,915 20	63 04	.....	11,978 24	11,978 24	.....	.....
Wheeling	West Virginia	16,706 09	4,311 47	319 11	21,336 67	4,801 85	.....	26,138 52	20,563 33	5,575 19	.....
Williamsport	Pennsylvania	13,645 28	1,324 22	.....	14,969 50	5,906 55	.....	20,876 05	18,940 92	1,935 13	.....
Wooster	Ohio	4,037 20	2,536 24	49 14	6,622 58	4,561 80	.....	11,184 38	5,914 67	5,269 71	.....
Worcester	Massachusetts	53,198 83	8,655 49	95 77	61,950 09	9,253 74	.....	71,203 83	69,055 07	2,148 76	.....
Zanesville	Ohio	11,411 53	2,626 36	.....	14,037 89	9,444 13	.....	23,482 02	19,729 16	3,752 86	.....
Total	.....	2,835,915 51	599,921 26	150,412 04	3,586,248 81	566,451 68	$3,326 57	4,149,373 92	3,893,854 30	262,151 83	6,632 20

* Changed to a deposit or collection office during the fiscal year ended June 30, 1875.

† Changed to a depository April 1, 1875.

EDWARD W. HARINER,
Third Assistant Postmaster-General.

ORDINARY POSTAGE-STAMPS.

Quarter ended—	NUMBER AND DENOMINATION OF STAMPS.												Value.
	1-cent.	2-cent.	3-cent.	5-cent.	6-cent.	7-cent.	10-cent.	12-cent.	15-cent.	24-cent.	30-cent.	90-cent.	
September 30, 1874	28, 373, 200	13, 738, 800	109, 825, 800	.....	2, 801, 650	349, 800	899, 550	257, 550	113, 760	86, 525	108, 830	20, 090	$4, 255, 288 00
December 31, 1874	34, 206, 700	15, 808, 500	116, 605, 600	.....	2, 756, 700	425, 700	1, 043, 230	310, 000	107, 960	35, 175	74, 020	8, 710	4, 547, 810 00
March 31, 1875	38, 451, 300	17, 883, 100	118, 961, 600	.....	3, 197, 400	415, 000	1, 081, 780	334, 500	212, 400	44, 525	51, 170	9, 200	4, 746, 412 00
June 30, 1875	29, 921, 100	21, 982, 800	115, 932, 500	363, 180	2, 892, 450	381, 400	1, 435, 690	418, 175	199, 260	105, 550	102, 890	7, 650	4, 721, 969 00
Total	130, 952, 300	69, 413, 200	461, 325, 500	363, 180	11, 648, 200	1, 571, 900	4, 460, 250	1, 320, 225	633, 380	271, 775	336, 910	45, 650	18, 271, 479 00

NEWSPAPER AND PERIODICAL POSTAGE-STAMPS.

Quarter ended—	NUMBER AND DENOMINATION OF STAMPS.												
	2-cent.	3-cent.	4-cent.	6-cent.	8-cent.	9-cent.	10-cent.	12-cent.	24-cent.	36-cent.	48-cent.	60-cent.	72-cent.
September 30, 1874	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December 31, 1874	470, 700	260, 800	272, 900	173, 250	51, 250	29, 000	89, 150	84, 400	53, 750	18, 300	17, 700	21, 750	5, 700
March 31, 1875	69, 795	33, 930	26, 600	27, 345	14, 000	7, 520	28, 610	22, 340	20, 845	12, 280	10, 940	10, 675	7, 025
June 30, 1875	49, 060	23, 365	25, 665	25, 380	14, 405	5, 210	32, 410	19, 785	17, 820	8, 585	8, 190	11, 381	6, 725
Total	589, 555	318, 095	325, 165	225, 975	79, 655	41, 730	150, 170	126, 525	92, 415	39, 165	36, 830	43, 806	19, 450

No. 7.—*Postage-stamps, stamped envelopes, newspaper-wrappers, and postal cards issued during the fiscal year ended June* 30, 1875—Continued.

NEWSPAPER AND PERIODICAL POSTAGE-STAMPS—Continued.

Quarter ended—	Number and denomination of stamps—Continued.											Value.
	84-cent.	96-cent.	$1.92.	$3.	$6.	$9.	$12.	$24.	$36.	$48.	$60.	
September 30, 1874	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
December 31, 1874	4,950	12,750	4,225	6,969	2,585	1,151	1,350	554	319	191	376	$253,434 00
March 31, 1875	6,850	10,505	9,500	6,768	3,544	2,611	2,548	1,590	1,009	831	640	321,088 70
June 30, 1875	5,957	9,910	6,337	7,222	3,173	1,606	2,184	1,046	343	305	780	241,379 77
Total	17,757	33,165	20,062	20,959	9,302	5,368	6,082	3,190	1,671	1,327	1,796	815,902 47

ORDINARY STAMPED ENVELOPES AND NEWSPAPER-WRAPPERS.

Quarter ended—	Number and denomination of envelopes.											Newspaper-wrappers.		Value.
	1-cent.	2-cent.	3-cent.	6-cent.	7-cent.	10-cent.	12-cent.	15-cent.	24-cent.	30-cent.	90-cent.	1-cent.	2-cent.	
September 30, 1874	3,592,750	555,000	13,105,050	29,500	250	16,250	.....	.....	.....	.....	.....	5,866,500	100,000	$569,654 76
December 31, 1874	4,331,000	739,000	13,064,850	57,800	750	11,000	100	200	350	350	.....	5,822,750	110,000	583,163 97
March 31, 1875	4,274,500	570,500	13,814,800	38,400	1,250	250	100	600	1,100	600	100	5,749,750	194,250	588,605 50
June 30, 1875	3,876,000	741,250	13,363,800	84,750	1,000	1,750	6,000	1,000	1,100	1,000	1,100	2,430,750	2,576,250	591,366 86
Total	16,074,250	2,605,750	53,348,500	210,450	3,250	29,250	6,200	1,800	2,550	1,950	1,200	19,869,750	2,980,500	2,332,791 09

STAMPED ENVELOPES BEARING A REQUEST FOR THE RETURN OF UNCLAIMED LETTERS, &c.

Quarter ended—	Number and denomination of envelopes.						Value.
	1-cent.	2-cent.	3-cent.	6-cent.	10-cent.	12-cent.	
September 30, 1874	297,000	341,000	15,101,250	47,000	.....	.....	$458,872 60
December 31, 1874	312,000	304,000	12,917,500	48,000	.....	1,000	452,160 70
March 31, 1875	335,500	368,500	13,020,750	45,000	.....	.....	444,346 05
June 30, 1875	281,000	375,000	12,794,000	42,000	500	.....	436,306 90
Total	1,225,500	1,388,500	51,833,500	182,000	500	1,000	1,791,686 25

POSTAL CARDS.

Quarter ended—	Number of cards.	Value.
September 30, 1874	24,481,000	$244,810 00
December 31, 1874	26,420,500	264,205 00
March 31, 1875	28,010,000	280,100 00
June 30, 1875	28,704,500	287,045 00
Total	107,616,000	1,076,160 00

OFFICIAL POSTAGE-STAMPS.

Quarter ended—	Number and denomination of stamps.												Value.
	1-cent.	2-cent.	3-cent.	6-cent.	7-cent.	10-cent.	12-cent.	15-cent.	24-cent.	30-cent.	90-cent.	$2.	
September 30, 1874	87,300	81,200	1,924,300	149,100	6,200	20,800	26,800	24,150	18,200	33,400	5,250	500	$98,637 50
December 31, 1874	162,500	109,100	2,603,500	270,200	3,500	35,000	26,900	9,260	13,350	13,550	2,4[illegible]0	.....	115,915 00
March 31, 1875	201,600	103,350	3,666,300	659,500	32,000	78,700	35,800	40,810	30,025	102,950	29,920	.....	239,188 50
June 30, 1875	177,100	192,400	5,849,700	1,110,700	61,000	168,600	79,700	57,025	41,175	87,025	63,600	500	381,229 25
Total	628,500	486,050	14,043,800	2,189,500	102,700	303,100	169,200	131,245	102,750	236,925	101,170	1,000	834,970 25

No. 7.—*Postage-stamps, stamped envelopes, newspaper-wrappers, and postal cards issued during the fiscal year ended June* 30, 1875—Continued.

OFFICIAL STAMPED ENVELOPES AND WRAPPERS.

Quarter ended—	NUMBER AND DENOMINATION OF ENVELOPES.				NEWSPAPER-WRAPPERS.		Value.
	2-cent.	3-cent.	6-cent.	12-cent.	1-cent.	2-cent.	
September 30, 1874	109, 000	2, 052, 750	43, 300	.....	150, 000	.....	$67, 877 70
December 31, 1874	186, 000	2, 383, 900	48, 000	.....	600, 000	.....	85, 392 20
March 31, 1875	135, 000	2, 859, 500	42, 300	5, 000	500, 000	200	97, 532 14
June 30, 1875	150, 500	3, 089, 650	42, 300	.....	450, 300	100	103, 720 14
Total	580, 500	10, 385, 800	173, 100	5, 000	1, 700, 300	300	354, 522 18

RECAPITULATION.

Articles.	Whole number.	Value.
Ordinary postage-stamps	682, 342, 470	$18, 271, 479 00
Newspaper and periodical stamps	2, 209, 215	815, 902 47
Ordinary stamped envelopes, plain	72, 285, 150	2, 046, 111 35
Ordinary stamped envelopes, request	54, 631, 000	1, 791, 686 25
Newspaper-wrappers	22, 850, 250	286, 679 74
Postal cards	107, 616, 000	1, 076, 160 00
Official postage-stamps	18, 495, 940	834, 970 25
Official stamped envelopes and wrappers	12, 845, 000	354, 522 18
Aggregate	973, 275, 025	25, 477, 511 24

EDWARD W. BARBER,
Third Assistant Postmaster-General.

'ostage-stamps, stamped envelopes, newspaper-wrappers, and postal cards issued during the fiscal year ended June 30, 1875.

escription.	Quarter ending September 30, 1874.	Quarter ending December 31, 1874.	Quarter ending March 31, 1875.	Quarter ending June 30, 1875.	Total.
y postage-stamps.					
.....	28, 373, 200	34, 206, 700	38, 451, 300	29, 921, 100	130, 952, 300
.....	13, 738, 800	15, 808, 500	17, 883, 100	21, 982, 800	69, 413, 200
.....	109, 825, 800	116, 605, 600	118, 961, 600	115, 932, 500	461, 325, 500
.....	.....	.....	.....	363, 180	363, 180
.....	2, 801, 650	2, 756, 700	3, 197, 400	2, 892, 450	11, 648, 200
.....	349, 800	425, 700	415, 000	381, 400	1, 571, 900
.....	899, 550	1, 043, 230	1, 081, 780	1, 435, 690	4, 460, 250
it	257, 550	310, 000	334, 500	418, 175	1, 320, 225
t	113, 760	107, 960	212, 400	199, 260	633, 380
ir-cent	86, 525	35, 175	44, 525	105, 550	271, 775
t	108, 830	74, 020	51, 170	102, 890	336, 910
t	20, 090	8, 710	9, 200	7, 650	45, 650
e	$4, 255, 288 00	$4, 547, 810 00	$4, 746, 412 00	$4, 721, 969 00	$18, 271, 479 00
r and periodical stamps.					
.....	.....	470, 700	69, 795	49, 060	589, 555
.....	.....	261, 800	33, 930	23, 365	318, 095
.....	.....	272, 900	26, 600	25, 665	325, 165
.....	.....	173, 250	27, 345	25, 380	225, 975
.....	.....	51, 250	14, 000	14, 405	79, 655
.....	.....	29, 000	7, 520	5, 210	41, 730
.....	.....	89, 150	28, 610	32, 410	150, 170
it	.....	84, 400	22, 340	19, 785	126, 525
ir-cent	.....	53, 750	20, 845	17, 820	92, 415
cent	.....	18, 300	12, 280	8, 585	39, 165
t-cent	.....	17, 700	10, 940	8, 190	36, 830
.....	.....	21, 750	10, 675	11, 381	43, 806
'o-cent	.....	5, 700	7, 025	6, 725	19, 450
r-cent	.....	4, 950	6, 850	5, 957	17, 757
-cent	.....	12, 750	10, 505	9, 910	33, 165
and ninety-two cent	.....	4, 225	9, 500	6, 337	20, 062
ar	.....	6, 969	6, 768	7, 222	20, 959
.....	.....	2, 585	3, 544	3, 173	9, 302
.....	.....	1, 151	2, 611	1, 606	5, 368
lar	.....	1, 350	2, 548	2, 184	6, 082
ir-dollar	.....	554	1, 590	1, 046	3, 190
dollar	.....	319	1, 009	343	1, 671
t-dollar	.....	191	831	305	1, 327
r	.....	376	640	780	1, 796
e	.....	$253, 434 00	$321, 088 70	$241, 379 77	$815, 902 47
'ostal cards.					
.....	24, 481, 000	26, 420, 500	28, 010, 000	28, 704, 500	107, 616, 000
e	$244, 810 00	$264, 205 00	$280, 100 00	$287, 045 00	$1, 076, 160 00
stamped envelopes.					
.....	3, 592, 750	4, 331, 000	4, 274, 500	3, 876, 000	16, 074, 250
.....	555, 000	739, 000	570, 500	741, 250	2, 605, 750
.....	13, 105, 050	13, 064, 850	13, 814, 800	13, 363, 800	53, 348, 500
.....	29, 500	57, 800	38, 400	84, 750	210, 450
.....	250	750	1, 250	1, 000	3, 250
.....	16, 250	11, 000	250	1, 750	29, 250
it	.....	100	100	6, 000	6, 200
it	.....	200	600	1, 000	1, 800
ir-cent	.....	350	1, 100	1, 100	2, 550
t	.....	350	600	1, 000	1, 950
t	.....	.....	100	1, 100	1, 200
rappers	5, 866, 500	5, 822, 750	5, 749, 750	2, 430, 750	19, 869, 750
vrappers	100, 000	110, 000	194, 250	2, 576, 250	2, 980, 500
e	$569, 654 76	$583, 163 97	$588, 605 50	$591, 366 86	$2, 332, 791 09
envelopes bearing a t to return letter.					
.....	297, 000	312, 000	335, 500	281, 000	1, 225, 500
.....	341, 000	304, 000	368, 500	375, 000	1, 388, 500

No. 8.—*Postage-stamps, stamped envelopes, &c.*—Continued.

Description.	Quarter ending September 30, 1874.	Quarter ending December 31, 1874.	Quarter ending March 31, 1875.	Quarter ending June 30, 1875.	Total.
Stamped envelopes bearing a request, &c.—Continued.					
Three-cent	13,101,250	12,917,500	13,020,750	12,794,000	51,833,500
Six-cent	47,000	42,000	45,000	42,000	182,000
Ten-cent	.....	.....	.....	500	500
Twelve-cent	.....	1,000	.....	.....	1,000
Value	$458,872 60	$452,160 70	$444,346 05	$436,306 90	$1,791,686 25
Official postage-stamps.					
One-cent	87,300	162,500	201,600	177,100	628,500
Two-cent	81,200	109,100	103,350	192,400	486,050
Three-cent	1,924,300	2,603,500	3,666,300	5,849,700	14,043,800
Six-cent	149,100	270,200	659,500	1,110,700	2,189,500
Seven-cent	6,200	3,500	32,000	61,000	102,700
Ten-cent	20,800	35,000	78,700	168,600	303,100
Twelve-cent	26,800	26,900	35,800	79,700	169,200
Fifteen-cent	24,150	9,260	40,810	57,025	131,245
Twenty-four-cent	18,200	13,350	30,025	41,175	102,750
Thirty-cent	33,400	13,550	102,950	87,025	236,925
Ninety-cent	5,250	2,400	29,920	63,600	101,170
Two-dollar	500	.....	.....	500	1,000
Value	$98,637 50	$115,915 00	$239,188 50	$381,229 25	$834,970 25
Official stamped envelopes and wrappers.					
Two-cent	109,000	186,000	135,000	150,500	580,500
Three-cent	2,052,750	2,383,900	2,859,500	3,089,650	10,385,800
Six-cent	40,300	48,000	42,300	42,500	173,100
Twelve-cent	.....	.....	5,000	.....	5,000
One-cent wrappers	150,000	600,000	500,000	450,300	1,700,300
Two-cent wrappers	.....	.....	200	100	300
Value	$67,877 70	$85,392 20	$97,532 14	$103,720 14	$354,522 18

RECAPITULATION.

Description.	Number.	Value.
Ordinary postage-stamps	682,342,470	$18,271,479 00
Newspaper and periodical postage-stamps	2,209,215	815,902 47
Postal cards	107,616,000	1,076,160 00
Ordinary stamped envelopes—plain	72,285,150	2,046,111 35
request	54,631,000	1,791,686 25
Total stamped envelopes	126,916,150	3,837,797 60
Newspaper-wrappers	22,850,250	286,679 74
Official postage-stamps	18,495,940	834,970 25
Official stamped envelopes and wrappers	12,845,000	354,522 18
Whole number and value of stamps, stamped envelopes, postal cards, and wrappers	973,275,025	25,477,511 24

EDWARD W. BARBER.
Third Assistant Postmaster General.

No. 9.—*Statement of the official postage-stamps and stamped envelopes furnished each of the Executive Departments during the fiscal year ended June 30, 1875.*

OFFICIAL POSTAGE-STAMPS.

Name of Department.	NUMBER AND DENOMINATION OF STAMPS.												Value.
	1-cent.	2-cent.	3-cent.	6-cent.	7-cent.	10-cent.	12-cent.	15-cent.	24-cent.	30-cent.	90-cent.	$2.	
Executive	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
State	.....	10,000	10,000	25,000	10,000	20,000	7,000	7,000	2,000	7,000	1,500	1,000	$12,520 00
Treasury	250,000	.....	1,150,000	600,000	75,000	150,000	.....	.....	.....	100,000	75,000	.....	190,750 00
War	173,600	64,550	186,600	113,600	10,700	13,500	20,750	23,025	18,600	31,875	2,200	.....	39,490 25
Navy	25,000	37,000	80,000	35,000	7,000	20,000	15,000	13,000	4,000	5,000	2,700	.....	16,620 00
Post-Office	98,900	126,500	11,873,200	1,099,600	.....	.....	25,250	12,120	11,550	13,900	9,250	.....	445,206 00
Interior	45,000	164,000	700,000	294,300	.....	50,600	63,200	32,100	34,000	26,150	10,020	.....	84,870 00
Justice	6,000	4,000	29,000	7,000	.....	4,000	6,000	4,000	2,600	3,000	500	.....	5,124 00
Agriculture	30,000	80,000	15,000	25,000	.....	45,000	32,000	40,000	30,000	50,000	.....	.....	40,390 00
Total	628,500	486,050	14,043,800	2,189,500	102,700	303,100	169,200	131,245	102,750	236,925	101,170	1,000	834,970 25

OFFICIAL STAMPED ENVELOPES AND WRAPPERS.

Name of Department.	NUMBER AND DENOMINATION OF ENVELOPES.				NEWSPAPER-WRAPPERS.		Value.
	2-cent.	3-cent.	6-cent.	12-cent.	1-cent.	2-cent.	
War	5,000	408,100	8,000	5,000	1,700,300	300	$33,775 18
Post-Office	575,500	9,977,700	165,100	.....	.....	.....	320,747 00
Total	580,500	10,385,800	173,100	5,000	1,700,300	300	354,522 18

EDWARD W. BARBER,
Third Assistant Postmaster-General.

No. 10.—*Statement showing the increase in the issue of postage-stamps, stamped envelopes, newspaper-wrappers, and postal cards, including the issues for official use, for the year ended June 30, 1875, over those of the preceding year.*

Description.	1874.		1875.		Increase.		Per cent. increase.	
	Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.
Ordinary postage-stamps	632, 733, 420	$17, 275, 242 00	682, 342, 470	$18, 271, 479 00	49, 609, 050	$996, 237 00	7. 84	5. 76
Newspaper and periodical postage-stamps	.....	.....	2, 209, 215	815, 902 47	2, 209, 215	815, 902 47	.....	.....
Ordinary stamped envelopes, plain	65, 107, 500	1, 927, 952 30	72, 285, 150	2, 046, 111 35	7, 177, 650	118, 159 05	11. 02	6. 12
Ordinary stamped envelopes, request	51, 940, 250	1, 733, 738 40	54, 631, 000	1, 791, 686 25	2, 690, 750	57, 947 85	5. 18	3. 34
Newspaper-wrappers	19, 370, 750	220, 502 06	22, 850, 250	286, 679 74	3, 479, 500	66, 177 68	17. 96	30. 01
Postal cards	91, 079, 000	910, 790 00	107, 616, 000	1, 076, 160 00	16, 537, 000	165, 370 00	18. 15	18. 15
Total ordinary issues	860, 230, 920	22, 068, 224 76	941, 934, 085	24, 288, 018 81	81, 703, 165	2, 219, 794 05	9. 49	10. 05
Add official postage-stamps	32, 320, 085	1, 415, 845 20	18, 495, 940	834, 970 25	*13, 824, 145	*580, 874 95	*42. 77	*40. 32
Add official stamped envelopes and wrappers	12, 900, 300	353, 456 66	12, 845, 000	354, 522 18	*55, 300	1, 065 52	*0. 42	0. 30
Aggregate	905, 451, 305	23, 837, 526 62	973, 275, 025	25, 477, 511 24	67, 823, 720	1, 639, 984 62	7. 49	6. 87

* Decrease.

EDWARD W. BARBER,
Third Assistant Postmaster-General.

Description.	Received.		Delivered.		[illegible]		acted upon.		[illegible]
	Number.	Actual or nominal value.	Number.	Actual or nominal value.	Number.	Actual or nominal value.	Number.	Actual or nominal value.	Number.
Containing $1 or more, (from last fiscal year)	3, 931	$12, 156 15							
Containing $1 or more, (received during the year)	14, 216	49, 532 10	9, 109	$43, 438 50	2, 142	$6, 857 68	6, 896	$11, 392 07	
Containing less than $1, (from last fiscal year)	9, 614	2, 849 90							
Containing less than $1, (received during the year)	16, 711	4, 909 67	15, 109	4, 162 83	8, 296	2, 232 49	2, 920	1, 364 25	
Registered letters containing money, (from last fiscal year)	85	391 70							
Registered letters containing money, (received during the year)	852	7, 327 14	813	6, 935 84	68	294 60	56	488 40	
Containing drafts, bills of exchange, &c., (from last fiscal year)	3, 726	471, 979 25							
Containing drafts, bills of exchange, &c., (received during the year)	13, 918	2, 965, 882 87	16, 102	3, 099, 524 70	892	208, 073 58	655	130, 263 84	
Registered letters containing drafts, &c., (received during the year)	307	31, 964 66	268	25, 603 20	34	6, 361 46			
Containing jewelry and other property, (from last fiscal year)	300								
Containing jewelry and other property, (received during the year)	16, 752		11, 028		6, 024				
Registered letters containing jewelry and other property, (received during the year)	144		104		31		9		
Containing receipts, bills lading, &c., (from last fiscal year)	190								
Containing receipts, bills lading, &c., (received during the year)	32, 805		29, 294		3, 701				
Containing photographs, (received during the year)	39, 120		29, 507		9, 613				
Containing postage-stamps, (received during the year)	46, 206		43, 584		2, 622				
Ordinary letters without inclosures, (from last fiscal year)	516, 493								
Ordinary letters without inclosures, (received during the year)	3, 232, 846		1, 338, 619				24, 000		† 282, 090 ‡ 2, 104, 630
Registered letters without inclosures, (received during the year)	812		629		183				
§ Ordinary foreign letters	210, 377		210, 377						
Registered foreign letters	3, 742		3, 742						
	*4, 163, 147	3, 546, 993 44	1, 708, 285	3, 179, 665 07	33, 606	223, 819 81	34, 536	143, 508 56	

* Classified as follows: Ordinary mail letters, 2,416,112; drop or local, 488.600; returned from foreign countries, (domestic origin,) 106,237; returned from hotels, 31,240; held for postage, 318,604; misdirected, 61,252; with no address, 5,963; ship and steamboat letters, (*i. e.* brought by sea outside the mails,) 2,412; registered, 5,857; foreign origin, 210,377; and 516,493 ordinary and drop-letters from last fiscal year. † Returned unclaimed a second time. ‡ Letters which could not be returned, circulars, &c. § Returned unopened to the countries where they originated.

EDWARD W. BARBER,
Third Assistant Postmaster-General.

No. 12.—*Statement showing the classification and disposition of letters containing valuable inclosures for fiscal year ended June 30, 1875.*

	Delivered.	Filed for reclamation.	Outstanding, in hands of postmasters.	Total.
Money	25,031	10,506	9,872	45,409
Called "Minor":				
Checks, drafts, bills of exchange, letters of credit, certificates of stock	9,463	326	289	10,078
Money-orders, foreign and domestic	4,235	287	109	4,631
Notes and due-bills	1,881	135	97	2,113
Deeds and land-warrants	212	45	40	297
Mortgages and assignments, releases, satisfaction of, &c	224	33	10	267
Leases and assignments of, &c	106	25	3	134
Powers of attorney	116	35	27	178
Passage and railroad tickets	133	40	80	253
Called "Sub-Minor":				
Receipts, bills of lading	15,189	1,246	.....	16,435
Legal documents	2,384	87	.....	2,471
Sealed foreign letters inclosed	2,188	194	.....	2,382
Sealed domestic letters inclosed	883	171	.....	1,054
Pension-vouchers, registered-letter receipts	465	21	.....	486
Locks of hair	873	1,329	.....	2,202
Paid notes, canceled checks, &c	630	36	.....	666
Photographs	29,507	9,613	.....	39,120
Postage-stamps	43,584	2,622	.....	46,206
Miscellaneous	6,682	617	.....	7,299
Called "Property":				
Jewelry and spectacles	921	441	2	1,364
Dry-goods and clothing	1,857	1,070	.....	2,927
Books, pictures, and music	2,869	1,739	4	4,612
Merchandise and samples	2,171	940	.....	3,111
Cutlery and instruments	144	83	.....	227
Manuscripts	227	202	.....	429
Miscellaneous	2,943	1,580	3	4,526
	154,918	33,423	10,536	198,877

EDWARD W. BARBER,
Third Assistant Postmaster-General.

No. 13.—*Statement showing number, contents, and disposition of registered letters received during the fiscal year ended June 30, 1875.*

	Delivered.	Filed.	Outstanding.	Total.
Money, including 85 letters from last fiscal year	813	68	56	9[illegible]
Minor:				
Certificates of stock	2	.....	.....	[illegible]
Drafts	226	34	.....	[illegible]
Deeds	4	1	.....	[illegible]
Powers of attorney	5	2	.....	[illegible]
Passage-tickets	31	2	.....	[illegible]
Property:				
Jewelry and spectacles	40	9	2	[illegible]
Pictures, &c	49	17	4	[illegible]
Miscellaneous	15	5	3	[illegible]
Without valuable inclosures	629	183	.....	8[illegible]
Foreign letters	*3,742	.....	.....	3,7[illegible]
	5,556	321	65	5,9[illegible]

* Returned unopened to country of origin.

EDWARD W. BARBER,
Third Assistant Postmaster-General.

POST-OFFICE DEPARTMENT, CONTRACT OFFICE,
Washington, D. C., November 9, 1875.

SIR: For a statement of the mail-service for the contract year ended June 30, 1875, &c., I have the honor to refer you to the tables hereto annexed.

Table A exhibits the character of the service, the length of routes, the number of miles of transportation, and the cost thereof, at the close of the contract year.

Table B exhibits the railroad-service as in operation on the 30th of June, 1875; also the cost per mile in each State and Territory.

Table C exhibits the steamboat-service as in operation on the 30th of June, 1875.

Table D shows the increase and decrease of mail-transportation and cost in the several States and Territories during the year ended June 30, 1875.

Table E shows the weight of the mails, the speed with which they are conveyed, the accommodations for mails and agents, the trips per week, and the rates of pay per mile per annum, on railroad-routes in States in which the contract term expired June 30, 1875, and also in other States and Territories, the returns having been obtained with a view to the re-adjustment of the pay in accordance with the act of March 3, 1873. This table is accompanied with an alphabetical index of the titles of the railroad companies carrying the mails.

Table F shows the re-adjustment of the rates of pay per mile on railroad-routes in States in which the contract term expired June 30, 1875, and also in other States and Territories; and on certain new routes the adjustment of the rates, based upon returns of the weight of the mails, the speed with which they are conveyed, the accommodations for mails and agents, and the number of trips per week, in accordance with the act of March 3, 1873. This table also is accompanied with an alphabetical index of the titles of the railroad companies carrying the mails.

Table G is a statement of the number, description, and cost of mail-bags purchased by contract and put into service during the year ended June 30, 1875; also, the number and cost of mail locks and keys purchased and repaired during said year.

Table H is a list of railway post-office lines in the United States June 30, 1875, showing the increase in the service since June 30, 1874.

Very respectfully, your obedient servant,

JAS. N. TYNER,
Second Assistant Postmaster-General.

Hon. MARSHALL JEWELL,
Postmaster-General.

A.—*Table of mail-service for the year ended June 30, 1875, as exhibited by the state of the arrangements at the close of the year.*

[The entire service and pay on each route are set down to the State under which the route is numbered, though extending sometimes into other States, instead of being divided among the States in which the different portions lie.]

States and Territories.	Length of routes.	Annual transportation and cost.						Total annual transportation by celerity, certainty, and security.	Total annual transportation by steamboat.	Total annual transportation by railroad.	Total annual transportation.	Total annual cost.
		Celerity, certainty, and security.		By steamboat.		By railroad.						
	Miles.	*Miles.*	*Dollars.*	*Miles.*	*Dollars.*	*Miles.*	*Dollars.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Dollars.*
Maine	4,489	3,476	88,145	.....	.....	1,013	142,456	1,595,568	.....	994,307	2,589,875	230,601
New Hampshire	1,836	1,104	32,546	60	1,850	672	66,911	505,076	18,200	741,677	1,264,953	101,307
Vermont	2,257	1,604	51,926	.....	.....	653	100,991	832,382	.....	656,473	1,488,855	152,917
Massachusetts	3,044	1,152	58,152	30	2,500	1,862	313,953	803,810	18,720	2,845,621	3,668,151	374,605
Rhode Island	584	230	10,871	198	16,000	156	19,256	123,240	135,969	276,153	535,362	46,127
Connecticut	1,673	640	27,377	.....	.....	1,033	160,430	354,864	.....	1,778,694	2,133,558	187,807
New York	12,049	6,281	265,015	213	8,335	5,555	1,280,218	3,154,768	127,175	8,771,640	12,053,583	1,553,768
New Jersey	2,267	898	34,287	68	3,503	1,301	152,129	463,502	69,472	1,972,961	2,505,935	189,919
Pennsylvania	14,169	9,795	293,475	52	3,570	4,322	463,253	4,0-5,062	27,170	6,079,714	10,111,946	760,298
Delaware	445	178	6,277	.....	.....	267	23,829	86,268	.....	227,523	313,791	30,106
Maryland	3,105	1,814	70,088	190	6,150	1,101	250,368	1,030,199	74,256	1,796,682	2,901,137	326,606
West Virginia	5,382	4,741	60,902	250	11,925	391	55,071	880,154	109,044	330,791	1,219,989	127,898
Virginia	9,975	7,442	132,534	968	45,807	1,565	221,522	1,951,042	381,385	1,593,812	3,926,239	399,863
North Carolina	9,325	7,880	98,967	351	8,585	1,094	88,108	1,430,179	81,952	960,238	2,472,369	195,660
South Carolina	4,019	2,629	31,314	59	1,460	1,331	118,493	341,393	10,608	1,480,890	1,832,891	151,267
Georgia	6,879	4,331	66,243	224	6,019	2,324	200,904	691,678	45,656	2,214,826	2,952,160	273,166
Florida	5,585	2,453	39,277	2,669	47,275	463	31,113	371,256	386,620	316,260	1,074,136	117,665
Alabama	8,567	6,037	105,087	510	10,317	2,020	188,696	1,040,055	105,352	1,653,743	2,799,150	304,100
Mississippi	6,054	4,680	82,660	260	7,500	1,114	150,371	788,476	54,080	1,050,024	1,892,580	240,531
Louisiana	5,251	3,443	142,621	1,288	90,831	520	66,114	840,685	371,800	467,366	1,679,851	299,566
Texas	14,202	11,586	496,574	1,063	82,550	1,553	157,669	2,733,037	201,757	1,167,316	4,102,110	736,793
Arkansas	9,129	7,771	250,460	1,059	66,990	299	20,615	1,921,334	274,560	164,419	2,360,313	338,065
Missouri	13,848	9,658	181,661	450	41,000	3,740	535,226	2,536,654	140,400	3,575,705	6,252,759	757,887
Tennessee	6,233	4,846	72,458	159	6,943	1,228	158,683	1,007,804	53,456	1,337,074	2,398,334	238,084
Kentucky	7,708	5,363	88,234	1,037	49,800	1,308	135,550	1,337,232	443,248	1,185,187	2,965,667	273,584
Ohio	12,352	6,680	157,753	281	13,800	5,391	972,835	2,279,267	103,771	5,677,936	8,060,974	1,144,388
Indiana	7,750	4,735	87,300	.....	.....	3,015	353,775	1,194,040	.....	3,294,109	4,488,149	441,075
Illinois	11,874	5,198	122,483	.....	.....	6,676	852,986	1,720,095	.....	7,274,708	8,994,803	975,469
Michigan	9,353	4,813	130,819	1,155	17,700	3,385	268,040	1,504,600	215,873	3,776,804	5,497,277	416,559
Wisconsin	8,128	5,447	107,866	96	65	2,585	255,106	1,523,028	5,824	2,510,177	4,039,029	363,037
Iowa	10,202	6,837	133,465	.....	.....	3,365	315,573	1,980,505	.....	2,412,364	4,392,869	449,038
Minnesota	7,949	5,051	100,366	.....	.....	2,198	149,643	1,193,816	.....	1,022,804	2,816,620	250,009
Nebraska	6,612	5,189	93,164	.....	.....	1,423	359,133	1,249,045	.....	997,205	2,246,250	443,297

Kansas	10,411	8,025	153,562	.....	.....	2,386	258,792	2,114,554	.....	1,867,894	3,982,448	412,354
Nevada	2,343	2,291	145,306	.....	.....	52	2,588	796,952	.....	32,292	829,244	147,894
California	10,189	7,369	400,082	1,012	35,400	1,808	271,999	2,702,168	247,800	1,437,877	4,387,845	707,481
Oregon	4,154	3,667	80,647	240	30,442	247	22,312	578,962	149,760	154,390	883,112	133,401
Washington Territory	3,020	1,068	37,978	1,846	67,613	106	6,336	208,988	104,944	65,894	379,826	111,927
Idaho Territory	1,188	1,188	78,759	.....	.....	.....	.....	355,742	.....	.....	355,742	78,759
Montana Territory	1,564	1,564	91,760	.....	.....	.....	.....	487,510	.....	.....	487,510	91,760
Dakota Territory	2,212	2,151	58,668	.....	.....	61	4,918	503,100	.....	38,364	541,464	63,586
Wyoming Territory	580	580	21,731	.....	.....	.....	.....	108,680	.....	.....	108,680	21,731
Utah Territory	3,156	2,985	280,971	.....	.....	171	9,632	1,423,114	.....	115,585	1,538,699	290,603
Colorado Territory	2,927	2,598	131,862	.....	.....	329	19,921	855,900	.....	237,411	1,093,311	151,783
Indian Territory	442	442	14,909	.....	.....	.....	.....	95,264	.....	.....	95,264	14,909
New Mexico Territory	2,111	2,111	156,096	.....	.....	.....	.....	652,246	.....	.....	652,246	156,096
Arizona Territory	1,981	1,981	80,023	.....	.....	.....	.....	355,160	.....	.....	355,160	80,023
Total	277,873	192,002	5,452,721	15,788	684,130	70,083	9,216,518	54,708,454	3,958,852	75,154,910	133,822,216	15,353,369
Railway-post-office clerks												1,122,640
Route-agents												943,800
Mail-route messengers												147,470
Local agents												96,580
Mail-messengers												621,311
Aggregate												18,285,170

JAS. N. TYNER,
Second Assistant Postmaster-General.

B.—*Railroad service as in operation on the 30th of June, 1875.*

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	MAINE.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
1	Augusta to Skowhegan	Maine Central	22 17		18 6	4,610 00		140 00 90 00	
2	Portland to Bangor	do	73.28 55		6 6	25,199 00		175 00 225 00	
3	Newport to Dexter	do	14		12	840 00		50 00	$140 per annum included for mail-messenger service.
4	Calais to Princeton	Saint Croix and Penobscot	21		6	2,100 00		50 00	$1,050 per annum included for mail-messenger service.
5	Portland to Augusta Branch, Brunswick to Bath	Maine Central	64 9		12 12	14,520 00		210 00 120 00	
6	Portland to Canada Line	Grand Trunk	92 73		12 6	22,770 00		138 00	
7	Portland to Rochester, N. H	Portland and Rochester	52		12	3,800 00		65 00	$420 per annum included for mail-messenger service.
9	Bangor to Vanceborough	Consolidated European and North American.	118.25		6	20,693 75		175 00	
10	Old Town to Abbot	do	54.2		6	2,981 00		55 00	
11	Belfast to Burnham Village	Maine Central	34.19		12	1,846 20		54 00	
12	Portland to Bartlett, N. H	Portland and Ogdensburgh	72.855		12	10,927 50		150 00	
13	Bath to Rockland	Knox and Lincoln	50		12	6,000 00		100 00	$1,000 per annum included for ferriage.
14	Houlton to New Brunswick Line	New Brunswick and Canada	3		6	150 00		50 00	
34	Farmington to Brunswick	Maine Central	71.5		6	5,412 50		75 00	$50 per annum included for mail-messenger service.
124	Portland to Portsmouth, N. H	Eastern	52		18	14,716 00		283 00	
221	Salmon Falls, N. H., to Portland, Me.	Boston and Maine	44.18		12	4,859 80		110 00	
231	West Waterville to Madison	Somerset	20.6		6	1,030 00		50 00	Pay estimated.
				1,013.055			142,455 75		
	NEW HAMPSHIRE.								
251	Concord to Nashua	Concord	36		18	8,100 00		225 00	
252	Concord to Wells River, Vt	Boston, Concord and Montreal	52 42		18 12	13,160 00		125 00	$1,410 per annum included for mail-messenger service.
253	Concord to White River Junction, Vt. Branch, Franklin to Bristol	Northern New Hampshire	69 13		12 6	14,910 00		190 00 50 00	$1,150 per annum included for mail-messenger service.

254	Concord to Claremont Junction	Concord and Claremont	54.99		12	6,598 80		120 00	$400 per annum included for mail-messenger service.
255	Concord to Portsmouth	Concord	60		12	3,600 00		60 00	
256	Manchester to North Weare	do	20.5		6	1,025 00		50 00	
257	Nashua to Greenfield	Boston and Lowell and Nashua and Lowell.	27		12	1,755 00		65 00	
258	Contoocook Village to Hillsborough Bridge.	Contoocook River	15		6	750 00		50 00	
259	Dover to Alton Bay	Boston and Maine	28		6	1,400 00		50 00	
260	Brock's Crossing to North Conway.	Portsmouth, Great Falls and Conway.	6 64.11		12 7	4,256 60		60 00	$50 per annum included for mail-messenger service.
261	Groveton to Wells River, Vt	Boston, Concord and Montreal	54		12	4,860 00		90 00	
262	Hookset to Pittsfield	Concord	20			1,000 00		50 00	12 times a week 8 months, 9 times a week 4 months.
351	Wolfborough Junction to Wolfborough.	Eastern	12.11		6	363 30		30 00	
352	Nashua to Acton, Mass	Nashua, Acton and Boston	23.44		6	937 60		40 00	
359	Wing Road to Fabyan House	Boston, Concord and Montreal	13.85		6	742 50		50 00	$50 per annum included for mail-messenger service.
360	Portsmouth to Dover	Eastern	11.64		6	582 00		50 00	
371	Nashua to Rochester	Nashua and Rochester	49.4		6	2,470 00		50 00	Pay estimated.
				672.04			66,910 80		
	VERMONT.								
401	Burlington to Rouse's Point, N. Y.	Central Vermont	24.5 31		15 6	9,802 50		185 00 170 00	
402	White River Junction to Derby Line.	Connecticut and Passumpsic Rivers and Massawippi Valley.	114.87		6	20,102 24		175 00	$1,435 87 per annum included for postal car.
403	Windsor to Burlington	Central Vermont	93 26		15 15	22,577 00		193 00 178 00	
405	Bellows Falls to Windsor	do	25		12	5,125 00		205 00	
406	Bellows Falls to Burlington	do	52 67.5		6 18	20,449 00		157 00 182 00	
407	Brattleborough to Bellows Falls	do	24		12	4,920 00		205 00	
408	Saint Albans to Canada Line	do	17		6	1,445 00		85 00	
409	Saint Albans to Richford	do	28.66		6	2,149 50		75 00	
410	West Concord to Johnson	Portland and Ogdensburgh	64.76		6	8,095 00		125 00	
522	Richford to Newport	Missisquoi and Clyde Rivers	31.38		6	3,138 00		100 00	
525	Leicester Junction to Ticonderoga Station.	Central Vermont	14.5		6	1,450 00		100 00	
528	Wells River to Montpelier	Montpelier and Wells River	38.62		6	1,737 90		45 00	
				652.79			100,991 14		
	MASSACHUSETTS.								
601	Boston to Portsmouth, N. H.	Eastern	56.5		24	16,667 50		295 00	
602	Boston to Salmon Falls, N. H. .. Branch, Rollingsford to Great Falls.	Boston and Maine	71.16 3		12 12	12,389 52		172 00 50 00	
603	Boston to Nashua, N. H	Boston and Lowell and Nashua and Lowell.	42		18	8,610 00		205 00	

A.—*Table of mail-service for the year ended June 30, 1875, as exhibited by the state of the arrangements at the close of the year.*

[The entire service and pay on each route are set down to the State under which the route is numbered, though extending sometimes into other States, instead of being divided among the States in which the different portions lie.]

States and Territories.	Length of routes.	Annual transportation and cost.						Total annual transportation by celerity, certainty, and security.	Total annual transportation by steamboat.	Total annual transportation by railroad.	Total annual transportation.	Total annual cost.
		Celerity, certainty, and security.		By steamboat.		By railroad.						
	Miles.	*Miles.*	*Dollars.*	*Miles.*	*Dollars.*	*Miles.*	*Dollars.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Dollars.*
Maine	4,489	3,476	88,145	.....	.....	1,013	142,456	1,595,568	.....	994,307	2,589,875	230,601
New Hampshire	1,836	1,104	32,546	60	1,850	672	66,911	505,076	18,200	741,677	1,264,953	101,307
Vermont	2,257	1,604	51,926	.....	.....	653	100,991	832,382	.....	656,473	1,488,855	152,917
Massachusetts	3,044	1,152	58,152	30	2,500	1,862	313,953	803,810	18,720	2,845,621	3,668,151	374,605
Rhode Island	584	230	10,871	198	16,000	156	19,256	123,240	135,969	276,153	535,362	46,127
Connecticut	1,673	640	27,377	.....	.....	1,033	160,430	354,864	.....	1,778,694	2,133,558	187,807
New York	12,049	6,281	265,015	213	8,535	5,555	1,280,218	3,154,768	127,175	8,771,640	12,053,583	1,553,768
New Jersey	2,267	898	34,287	68	3,503	1,301	152,129	463,502	69,472	1,972,961	2,505,935	189,919
Pennsylvania	14,169	9,795	293,475	52	3,570	4,322	463,253	4,0[illegible]5,062	27,170	6,079,714	10,111,946	760,298
Delaware	445	178	6,277	.....	.....	267	23,829	86,268	.....	227,523	313,791	30,106
Maryland	3,105	1,814	70,088	190	6,150	1,101	250,368	1,030,199	74,256	1,796,682	2,901,137	326,606
West Virginia	5,382	4,741	60,902	250	11,925	391	55,071	880,154	109,044	330,791	1,319,989	127,898
Virginia	9,975	7,442	132,534	968	45,807	1,565	221,522	1,951,042	381,385	1,593,812	3,926,239	399,863
North Carolina	9,325	7,880	98,967	351	8,585	1,094	88,108	1,430,179	81,952	960,238	2,472,369	195,660
South Carolina	4,019	2,629	31,314	59	1,460	1,331	118,493	341,393	10,608	1,480,890	1,832,891	151,267
Georgia	6,879	4,331	66,243	224	6,019	2,324	200,904	691,678	45,656	2,214,826	2,952,160	273,166
Florida	5,585	2,453	39,277	2,669	47,275	463	31,113	371,256	386,620	316,260	1,074,136	117,665
Alabama	8,567	6,037	105,087	510	10,317	2,020	188,696	1,040,055	105,352	1,653,743	2,799,150	304,100
Mississippi	6,054	4,680	82,660	260	7,500	1,114	150,371	788,476	54,080	1,050,024	1,892,580	240,531
Louisiana	5,251	3,443	142,621	1,288	90,831	520	66,114	840,685	371,800	467,366	1,679,851	299,566
Texas	14,202	11,586	496,574	1,063	82,550	1,553	157,669	2,733,037	201,757	1,167,316	4,102,110	736,703
Arkansas	9,129	7,771	250,460	1,059	66,990	299	20,615	1,921,334	274,560	164,419	2,360,313	338,065
Missouri	13,848	9,658	181,661	450	41,000	3,740	535,226	2,536,654	140,400	3,575,705	6,252,759	757,887
Tennessee	6,233	4,846	72,458	159	6,943	1,228	158,683	1,007,804	53,456	1,337,074	2,398,334	238,084
Kentucky	7,708	5,363	88,234	1,037	49,800	1,308	135,550	1,337,232	443,248	1,185,187	2,965,667	273,584
Ohio	12,352	6,680	157,753	281	13,800	5,391	972,835	2,279,267	103,771	5,677,936	8,060,974	1,144,388
Indiana	7,750	4,735	87,300	.....	.....	3,015	353,775	1,194,040	.....	3,294,109	4,488,149	441,075
Illinois	11,874	5,198	122,483	.....	.....	6,676	852,986	1,720,095	.....	7,274,708	8,994,803	975,469
Michigan	9,353	4,813	130,819	1,155	17,700	3,385	268,040	1,504,600	215,873	3,776,804	5,497,277	416,559
Wisconsin	8,128	5,447	107,866	96	65	2,585	255,106	1,523,028	5,824	2,510,177	4,039,029	363,037
Iowa	10,202	6,837	133,465	.....	.....	3,365	315,573	1,980,505		[illegible]	4,392,869	449,038
Minnesota	[illegible]	[illegible]	[illegible]			2,198	149,643	[illegible]				

[illegible]	[illegible]	[illegible]	[illegible]	.....	.....	.....	.....	[illegible]	.....	.....	[illegible]	[illegible]
Dakota Territory	2, 212	2, 151	58, 668	.....	.....	61	4, 918	503, 100	.....	38, 364	541, 464	63, 586
Wyoming Territory	580	580	21, 731	.....	.....	.....	.....	108, 680	.....	.....	108, 680	21, 731
Utah Territory	3, 156	2, 985	280, 971	.....	.....	171	9, 632	1, 423, 114	.....	115, 585	1, 538, 699	290, 603
Colorado Territory	2, 927	2, 598	131, 862	.....	.....	329	19, 921	855, 900	.....	237, 411	1, 093, 311	151, 783
Indian Territory	442	442	14, 909	.....	.....	.....	.....	95, 264	.....	.....	95, 264	14, 909
New Mexico Territory	2, 111	2, 111	156, 096	.....	.....	.....	.....	652, 246	.....	.....	652, 246	156, 096
Arizona Territory	1, 981	1, 981	80, 023	.....	.....	.....	.....	355, 160	.....	.....	355, 160	80, 023
Total	277, 873	192, 002	5, 452, 721	15, 788	684, 130	70, 083	9, 216, 518	54, 708, 454	3, 958, 852	75, 154, 910	133, 822, 216	15, 353, 369
Railway-post-office clerks												1, 122, 640
Route-agents												943, 800
Mail-route messengers												147, 470
Local agents												96, 580
Mail-messengers												621, 311
Aggregate												18, 285, 170

JAS. N. TYNER,
Second Assistant Postmaster-General.

B.—*Railroad service as in operation on the 30th of June, 1875.*

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	MAINE.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
1	Augusta to Skowhegan	Maine Central	22 17		18 6	4,610 00		140 00 90 00	
2	Portland to Bangor	do	73.28 55		6 6	25,199 00		175 00 225 00	
3	Newport to Dexter	do	14		12	840 00		50 00	$140 per annum included for mail-messenger service.
4	Calais to Princeton	Saint Croix and Penobscot	21		6	2,100 00		50 00	$1,050 per annum included for mail-messenger service.
5	Portland to Augusta Branch, Brunswick to Bath	Maine Central	64 9		12 12	14,520 00		210 00 120 00	
6	Portland to Canada Line	Grand Trunk	92 73		12 6	22,770 00		138 00	
7	Portland to Rochester, N. H	Portland and Rochester	52		12	3,800 00		65 00	$420 per annum included for mail-messenger service.
9	Bangor to Vanceborough	Consolidated European and North American.	118.25		6	20,693 75		175 00	
10	Old Town to Abbot	do	54.2		6	2,981 00		55 00	
11	Belfast to Burnham Village	Maine Central	34.19		12	1,846 20		54 00	
12	Portland to Bartlett, N. H	Portland and Ogdensburgh	72.855		12	10,927 50		150 00	
13	Bath to Rockland	Knox and Lincoln	50		12	6,000 00		100 00	$1,000 per annum included for ferriage.
14	Houlton to New Brunswick Line	New Brunswick and Canada	3		6	150 00		50 00	
34	Farmington to Brunswick	Maine Central	71.5		6	5,412 50		75 00	$50 per annum included for mail-messenger service.
124	Portland to Portsmouth, N. H	Eastern	52		18	14,716 00		283 00	
221	Salmon Falls, N. H., to Portland, Me.	Boston and Maine	44.18		12	4,859 80		110 00	
231	West Waterville to Madison	Somerset	20.6		6	1,030 00		50 00	Pay estimated.
				1,013.055			142,455 75		
	NEW HAMPSHIRE.								
251	Concord to Nashua	Concord	36		18	8,100 00		225 00	
252	Concord to Wells River, Vt	Boston, Concord and Montreal	52		18	13,160 00		125 00	$1,410 per annum included for mail-messenger service.
253	Concord to White River Junction, Vt. Branch, Franklin to Bristol	Northern New Hampshire	69 13		12 6	14,910 00		50 00	

257	Nashua to Greenfield	Boston and Lowell and Nashua and Lowell.	27		12	1,733 00		65 00	
258	Contoocook Village to Hillsborough Bridge.	Contoocook River	15		6	750 00		50 00	
259	Dover to Alton Bay	Boston and Maine	28		6	1,400 00		50 00	
260	Brock's Crossing to North Conway.	Portsmouth, Great Falls and Conway.	6 64.11		12 7	4,256 60		60 00	$50 per annum included for mail-messenger service.
261	Groveton to Wells River, Vt	Boston, Concord and Montreal	54		12	4,860 00		90 00	
262	Hookset to Pittsfield	Concord	20			1,000 00		50 00	12 times a week 8 months, 9 times a week 4 months.
351	Wolfborough Junction to Wolfborough.	Eastern	12.11		6	363 30		30 00	
352	Nashua to Acton, Mass	Nashua, Acton and Boston	23.44		6	937 60		40 00	
359	Wing Road to Fabyan House	Boston, Concord and Montreal	13.85		6	742 50		50 00	$50 per annum included for mail-messenger service.
360	Portsmouth to Dover	Eastern	11.64		6	582 00		50 00	
371	Nashua to Rochester	Nashua and Rochester	49.4		6	2,470 00		50 00	Pay estimated.
				672.04			66,910 80		
	VERMONT.								
401	Burlington to Rouse's Point, N. Y.	Central Vermont	24.5 31		15 6	9,802 50		185 00 170 00	
402	White River Junction to Derby Line.	Connecticut and Passumpsic Rivers and Massawippi Valley.	114.87		6	20,102 24		175 00	$1,435 87 per annum included for postal car.
403	Windsor to Burlington	Central Vermont	93 26		15 15	22,577 00		193 00 178 00	
405	Bellows Falls to Windsor	do	25		12	5,125 00		205 00	
406	Bellows Falls to Burlington	do	52 67.5		6 18	20,449 00		157 00 182 00	
407	Brattleborough to Bellows Falls	do	24		12	4,920 00		205 00	
408	Saint Albans to Canada Line	do	17		6	1,445 00		85 00	
409	Saint Albans to Richford	do	28.66		6	2,149 50		75 00	
410	West Concord to Johnson	Portland and Ogdensburgh	64.76		6	8,095 00		125 00	
522	Richford to Newport	Missisquoi and Clyde Rivers	31.38		6	3,138 00		100 00	
525	Leicester Junction to Ticonderoga Station.	Central Vermont	14.5		6	1,450 00		100 00	
528	Wells River to Montpelier	Montpelier and Wells River	38.62		6	1,737 90		45 00	
				652.79			100,991 14		
	MASSACHUSETTS.								
601	Boston to Portsmouth, N. H	Eastern	56.5		24	16,667 50		295 00	
602	Boston to Salmon Falls, N. H Branch, Rollingsford to Great Falls.	Boston and Maine	71.16 3		12 12	12,389 52		172 00 50 00	
603	Boston to Nashua, N. H	Boston and Lowell and Nashua and Lowell.	42		18	8,610 00		205 00	

B.—*Railroad service as in operation on the 30th of June*, 1875—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	MASSACHUSETTS—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
604	Boston to Fitchburgh	Fitchburgh	52		18	11,440 00		220 00	
605	Boston to Albany, N. Y.	Boston and Albany	101 102		26 13	109,123 00		680 00 396 50	
606	Boston to Woonsocket Falls, R. I.	Boston, Hartford and Erie	39.68		15	2,640 80		60 00	$260 per annum included for mail-messenger service.
607	Boston to Southbridge	do	70		12	7,560 00		108 00	
608	Boston to Providence, R. I.	Boston and Providence	23 21		24 12	5,720 00		130 00	
609	Boston to Plymouth Branch, Atlantic to West Quincy	Old Colony	11.28 26.72 3.45		42 12 6	6,767 50		150 00 150 00 50 00	$895 per annum included for mail-messenger service.
610	Boston to Medford	Boston and Maine	5.5		12	335 00		50 00	$60 per annum included for mail-messenger service.
615	Boston to West Lynn Depot	Eastern	10		12	500 00		50 00	
616	Boston to Dedham	Boston and Providence	11		12	550 00		50 00	
617	Grafton Depot to Millbury	Boston and Albany	4		12	200 00		50 00	
618	Salem to Gloucester	Eastern	16		18	1,072 00		67 00	
619	Salem to Marblehead	do	4		12	200 00		50 00	
620	Salem to Lawrence	do	20		6	800 00		40 00	
621	Georgetown to Haverhill	Boston and Maine	6.5		12	325 00		50 00	
622	Lawrence to Manchester, N. H.	Manchester and Lawrence	28		18	4,564 00		163 00	
623	Lowell to Lawrence	Boston and Lowell and Nashua and Lowell.	14		21	1,050 00		50 00	$350 per annum included for mail-messenger service.
624	Winchester to Woburn	do	3		12	150 00		50 00	
625	Somerville Station to Concord	do	15.96		12	798 00		50 00	
626	South Acton Depot to Hudson	Fitchburgh	9		12	500 00		50 00	$50 per annum included for mail-messenger service.
627	Ayer to Lowell	Boston and Lowell and Nashua and Lowell.	17		15	850 00		50 00	
628	Ayer to Greenville, N. H.	Fitchburgh	23		12	1,437 50		62 50	
629	Auburndale Station to Newton Lower Falls.	Boston and Albany	2		6	100 00		50 00	
630	Natick to Saxonville	do	4		12	200 00		50 00	
631	South Framingham to Pratt's Junction.	Boston, Clinton and Fitchburgh	29		18	2,610 00		90 00	
632	South Framingham to Milford	Boston and Alban[illegible]	13		3[illegible]	1,0[illegible]		60 00	$300 per annum included for mail-messenger service.

634	South Braintree Junction to Newport.	Old Colony	61.75		12	9,575 00		140 00	$930 per annum included for mail-messenger service.
635	South Abington to Bridgewater	do	7.75		6	390 00		40 00	$80 per annum included for mail-messenger service.
636	Braintree Depot to Cohasset	South Shore	12		12	1,400 00		58 00	$704 per annum included for mail-messenger service.
637	Middleborough to Hyannis	Old Colony	47		12	8,191 00		153 00	$1,000 per annum included for mail-messenger service.
638	Yarmouthport to Provincetown	do	60.51		12	11,140 18		118 00	$4,000 per annum included for mail-messenger service.
639	New Bedford to West Wareham	New Bedford	16.25		15	1,093 75		50 00	$281.25 per annum included for mail-messenger service.
640	Taunton to Middleborough	Old Colony	10.54		30	527 00		50 00	
641	Taunton to Mansfield Junction	New Bedford	12		36½	2,100 00		125 00	$600 per annum included for mail-messenger service.
642	Taunton to New Bedford	do	20.5		27	3,339 00		133 00	$612.50 per annum included for mail-messenger service.
643	Worcester to Nashua, N. H.	Worcester and Nashua	46.25		18	4,948 75		107 00	
644	Sterling Junction to Fitchburgh	Boston, Clinton and Fitchburgh	14		18	1,260 00		90 00	
645	Fitchburgh to Bellows Falls, Vt.	Cheshire	64		18	10,240 00		160 00	
646	Fitchburgh to Hoosac Tunnel Branch, Greenfield to Turner's Falls.	Fitchburgh	69 18 5		6 6 6	14,860 00		150 00 160 00 50 00	
647	Palmer to Miller's Falls	Central Vermont	35		12	3,500 00		100 00	
648	Springfield to South Vernon Junction, Vt. Side-supply to Chickopee Falls.	Connecticut River	50		15	11,800 00		230 00	$300 per annum included for mail-messenger service.
649	South Vernon Junction to Keene, N. H.	Cheshire	24		12	1,500 00		62 50	
650	Pittsfield to North Adams	Boston and Albany	21		18	1,575 00		60 00	$315 per annum included for mail-messenger service.
651	Gloucester to Pigeon Cove	Eastern	6.5		12	450 00		50 00	$125 per annum included for mail-messenger service.
652	Wakefield to Newburyport	Boston and Maine	30.5		12	1,525 00		50 00	
653	South Braintree Junction to Fall River.	Old Colony	34		12	2,700 00		50 00	$1,000 per annum included for mail-messenger service.
654	East Salisbury to Amesbury	Eastern	4		12	250 00		50 00	$50 per annum included for mail-messenger service.
655	Palmer to Winchendon	Boston and Albany	15.75 7.96 25.54		24 18 12	2,462 50		50 00	
656	Mansfield to South Framingham	Boston, Clinton and Fitchburgh	22		6	1,320 00		60 00	
657	Winchendon to Peterborough, N. H.	Boston, Barre and Gardner, lessees of Monadnock Railroad.	16.37		6	1,178 64		72 00	
658	Springfield to Athol Depot	Springfield, Athol and Northeastern.	49.98		6	2,998 86		57 00	$150 per annum included for mail-messenger service.
659	South Framingham to Lowell	Boston, Clinton and Fitchburgh	29		12	1,798 00		62 00	
660	Worcester to Winchendon	Boston, Barre and Gardner	37		12	3,237 50		87 50	
661	Holyoke to Westfield	New Haven and Northampton	10.53		12	526 50		50 00	
662	Milford to Bellingham Junction	Providence and Worcester	5		12	250 00		50 00	
736	Milford to Ashland	do	11.68		6	584 00		50 00	

B.—*Railroad service as in operation on the 30th of June*, 1875—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	MASSACHUSETTS—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
737	Cohasset Narrows to Wood's Hole	Old Colony	17.67	.....	6	1,311 51	.....	53 00	$375 per annum included for mail-messenger service.
741	Wenham to Essex	Eastern	5.55	.....	6	277 50	.....	50 00	Pay estimated.
742	Lynn to Marblehead	do	6.05	.....	6	302 50	.....	50 00	Do.
743	Wakefield to Peabody	do	8.54	.....	6	427 00	.....	50 00	Do.
744	Miller's Falls to Brattleborough, Vt.	Central Vermont	21	.....	18	3,937 50	.....	187 50	
745	Newton Junction to West Amesbury.	Boston and Maine	5.05	.....	6	252 50	.....	50 00	Pay estimated.
746	Taunton to Attleborough	New Bedford	16.67	.....	28	1,250 25	.....	75 00	
747	Cohasset to Kingston	Duxbury and Cohasset	20.88	.....	6	1,044 00	.....	50 00	
				1,862.52			313,953 26		
	RHODE ISLAND.								
801	Providence to Worcester, Mass.	Providence and Worcester	44	.....	18	6,340 00	.....	110 00	$1,500 per annum included for mail messenger service.
802	Providence to New London, Conn.	Stonington and Providence	63.75	.....	22½	9,243 75	.....	145 00	
803	Providence to Bristol	Providence, Warren and Bristol	14.6	.....	12	1,926 00	.....	60 00	$1,050 per annum included for mail-messenger service.
804	Warren to Fall River, Mass.	Fall River, Warren and Providence	7	.....	12	420 00	.....	60 00	
823	Providence to Pascoag	Providence and Springfield	23.12	.....	6	1,156 00	.....	50 00	Pay estimated.
825	Wickford Landing to Wickford Junction.	Newport and Wickford	3.4	.....	6	170 00	.....	50 00	Do.
				155.87			19,255 75		
	CONNECTICUT.								
901	Norwich to Worcester, Mass.	Boston, Hartford, and Erie	60	.....	12	5,100 00	.....	85 00	
902	New London to Palmer, Mass.	Central Vermont	30 35	.....	23 18	7,800 00	.....	120 00	
903	Middletown to Berlin Depot	New York, New Haven and Hartford.	10	.....	18	770 00	.....	52 00	$250 per annum included for mail-messenger service.
904	New Haven to New London	do	50	.....	23	8,817 00	.....	175 00	$67 per annum included for mail-messenger service.
905	New Haven to Springfield, Mass. Branch, Windsor Locks to Suffield.	do	63.839 4.76	.....	31 6	31,963 16	.....	497 00 50 00	Pay on branch estimated.

907	New Haven to New York	New York, New Haven and Hartford.	76.333		31	45,418 33		595 00	
908	Bridgeport to Winsted Branch, Waterbury to Watertown.	Naugatuck	62 5.75		12 6	7,753 50		118 00 50 00	$150 per annum included for mail-messenger service.
909	Bridgeport to Pittsfield, Mass. Branch, Van Deusenville to State Line. Branch, Danbury to Brookfield Junction.	Housatonic	110 11 5.5		12 6 6	11,275 00		96 00 50 00 30 00	
910	South Norwalk to Danbury Branch, Branchville to Ridgefield. Branch, Bethel to Hawleyville	Danbury and Norwalk	23.5 4 6.01		24½ 12 12	3,085 00		110 00 50 00 50 00	
911	Waterbury to Providence, R. I	Hartford, Providence and Fishkill	122.5		22¾	9,800 00		80 00	
912	Vernon Depot to Rockville Side supply of Vernon	do	4.625		18	500 00		50 00	$268.75 per annum included for mail-messenger service.
913	New Haven to Willimantic	New Haven, Middletown and Willimantic.	24 32		12 6	2,800 00		50 00	
914	Hartford to Saybrook Point	Connecticut Valley	43.16		12	2,589 60		60 00	
915	New Haven to Ansonia	New Haven and Derby	13.5		12	742 50		55 00	
916	Hartford to Millerton, N. Y	Connecticut Western	68.18		9½	3,459 00		50 00	
917	Litchfield to Hawleyville	Shepaug	32.25		12	1,935 00		60 00	
975	East Thompson to Willimantic	Boston, Hartford and Erie	33.68		6	2,116 80		60 00	$96 per annum included for mail-messenger service.
				1,033.303			160,429 69		
	NEW YORK.								
1201	New York to Dunkirk	Erie	66 393		25½ 19½	323,595 00		705 00	
1202	Suffern to Piermont	do	18		6	900 00		50 00	
1203	Buffalo to Suspension Bridge	do	25.94		13	1,686 10		65 00	
1204	Newburgh to Chester Branch, Vail's Gate to Junction with main stem.	do	19.75 12.75		12 12	1,921 25		65 00 50 00	
1205	Rochester to Avon	do	18		12	1,440 00		80 00	
1206	Avon to Dansville	do	30.73		12	1,843 80		60 00	
1207	Attica to Corning	do	111		19½	30,525 00		275 00	
1208	Buffalo to Hornellsville	do	91		22½	32,987 50		362 50	
1209	Goshen to Montgomery	do	10.25		6	512 50		50 00	
1210	Goshen to Pine Island	do	11		6	440 00		40 00	
1211	New York to Troy	New York Central and Hudson River.	150		54	89,550 00		597 00	
1212	Troy to Schenectady	do	22		18	1,804 00		82 00	
1213	Syracuse to Rochester	do	104		21½	15,600 00		150 00	
1214	Canandaigua to Niagara Falls	do	97		6	7,275 00		75 00	
1215	Buffalo to Lockport	do	22		12	1,650 00		75 00	

B.—*Railroad service as in operation on the 30th of June,* 1875—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	NEW YORK—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
1216	Buffalo to Lewiston	New York Central and Hudson River.	29		6	2,175 00		75 00	
1217	Albany to Buffalo	do	229 69		34 34	177,326 00		602 00 572 00	
1218	Rochester to Niagara Falls	do	76		24	16,264 00		214 00	
1219	New York to Chatham Village	New York and Harlem	130.5		6	13,050 00		100 00	Old rate of pay.
1220	Saratoga Springs to Castleton, Vt.	Delaware and Hudson Canal Company.	54		12	8,100 00		150 00	Do.
1221	Eagle Bridge to Rutland, Vt	do	62.5		12	9,375 00		150 00	Do.
1222	Troy to Saratoga Springs	do	32.81		12	4,921 50		150 00	Do.
1223	Schenectady to Ballston	do	16		12	800 00		50 00	Do.
1224	Albany to Albany Junction	do	12		18	1,029 00		85 75	Do.
1225	Oswego to Richland	Rome, Watertown and Ogdensburgh.	28.5		12	1,852 50		65 00	
1226	Watertown to Cape Vincent	do	26		12	1,625 00		62 50	
1227	Rome to Ogdensburgh Branch, De Kalb Junction to Potsdam Junction.	do	72.62 69.38 25		18 12 6	21,158 50		138 00 138 00 62 50	
1228	Chenango Forks to Norwich	Delaware, Lackawanna and Western.	30.69		12	1,841 40		60 00	
1229	Utica to Norwich	do	54.5		12	4,360 00		80 00	
1230	Owego to Ithaca	do	35		12	2,800 00		80 00	
1231	Cassville Junction to Richfield Springs.	do	21		12	1,155 00		55 00	
1232	Mineola to Locust Valley	Long Island	12.25		12	612 50		50 00	
1233	New York to Greenport Branch, Mineola to Hempstead.	do	32 35 31 2.5		12 9 6 12	11,045 00		90 00	$2,000 per annum included for mail-messenger service at New York.
1234	Hicksville to Northport	do	16.5		12	825 00		50.00	
1235	Oswego to Middletown Branch, Summit Junction to Ellenville.	New York and Oswego Midland	250.2 8		6 6	12,910 00		50 00	Pay estimated.
1236	Sidney Plains to New Berlin	do	24.84		6	1,242 00		50 00	
1239	Clinton to Rome	do	13.75		12	687 50		50 00	
1240	Walton to Delhi	do	16		12	800 00		50 00	

	Buffalo to Chicago	ern.	135.2 222.3		36 12			615 00 485 00	
1242	Rouse's Point to Ogdensburgh	Central Vermont	119		9	14,875 00		125 00	
1243	Plattsburgh to Canada line	New York and Canada	23		12	1,150 00		50 00	
1244	Cobleskill to Cherry Valley	Delaware and Hudson Canal Company.	22.47		12	1,123 50		50 00	
1245	Albany to Binghamton	do	142		18	14,200 00		100 00	
1246	Schoharie to Middleburgh	Middleburgh and Schoharie	5.5		12	395 00		50 00	$120 per annum included for side service.
1247	Central Bridge to Schoharie	Schoharie Valley	5		18	400 00		80 00	
1248	Utica to Smith's Valley Station	New York and Oswego Midland	31.4		6	1,570 00		50 00	
1249	Buffalo to Emporium	Buffalo, New York and Philadelphia.	123.51		6	7,410 60		60 00	
1250	Fredonia to Dunkirk	Dunkirk and Fredonia	3.5		27	500 00		142 86	
1251	Skaneateles Junction to Skaneateles.	Skaneateles	5.5		12	560 00		50 00	$285 per annum included for mail-messenger service.
1252	Brockton to Corry, Pa	Oil Creek and Allegheny River and Buffalo, Corry and Pittsburgh.	45.3		6	3,000 90		53 00	$600 per annum included for side service.
1253	Chesterville to Warwick	Warwick Valley	11		12	550 00		50 00	Old rate of pay.
1255	Canandaigua to Elmira	Northern Central	68.5		12	10,275 00		150 00	Do.
1256	Syracuse to Oswego	Oswego and Syracuse	35.5		18	3,550 00		100 00	
1257	Syracuse to Binghamton	Syracuse, Binghamton and New York.	80		12	7,200 00		90 00	
1258	Rouse's Point to Canada Line	Champlain and Saint Lawrence	2.25		6	262 50		116 66	
1259	Troy to North Adams, Mass Branch, North Hoosick Junction to State Line.	Troy and Boston	23.2 26.8 5.5		24 18 6	6,937 50		125 00	
1260	Stapleton to Tottenville	Staten Island	21		12	1,800 00		50 00	$750 per annum included for side service.
1261	Hudson to West Stockbridge, Mass	Hudson and Boston	35		12	1,750 00		50 00	Old rate of pay.
1262	East Gainesville to Perry	Rochester and Pine Creek	6.55		12	327 50		50 00	
1263	Port Henry to Whitehall	New York and Canada	39.43		6	2,464 37		62 50	
1264	Syracuse to Earlville	Syracuse and Chenango Valley	20 22.47		12 6	2,123 50		50 00	
1265	Dunkirk to Titusville, Pa	New York Central and Hudson River.	91.16		6	4,558 00		50 00	
1266	Ithaca to State line	Ithaca and Athens	34.6		6	1,730 00		50 00	
1267	Syracuse to Lacona	Syracuse Northern	44.92		12	2,470 60		55 00	
1268	Rondout to Stamford	New York, Kingston and Syracuse	73.3		12	3,665 00		50 00	
1269	Ithaca to Norwich	Utica, Ithaca, and Elmira	23 47.75		12 12	3,882 50		65 00 50 00	
1270	Port Jervis to Monticello	Monticello and Port Jervis	24		6	1,200 00		50 00	
1271	Poughkeepsie to State Line, Mass	Poughkeepsie and Eastern	43.15		6	2,157 50		50 00	Old rate of pay.
1272	Canastota to Cazenovia	Cazenovia, De Ruyter and Canastota.	15		18	750 00		50 00	
1273	Fonda to Gloversville	Fonda, Johnstown and Gloversville.	10		12	1,390 00		64 00	$750 per annum included for side service.
1274	Johnsonville to Greenwich	Greenwich and Johnsonville	14		12	600 00		42 86	Old rate of pay.

B.—*Railroad service as in operation on the 30th of June*, 1875—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	NEW YORK—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
1275	Montgomery to Kingston	Wallkill Valley	33.46		6	1,003 80		30 00	
1276	Athens to Fair Haven	Southern Central	122		6	8,520 00		60 00	$1,200 per annum included for side service.
1277	Newburgh to Millerton Branch, Clove Branch Junction to Sylvan Lake.	Dutchess and Columbia	56.5 4.5		6 6	3,050 00		50 00 50 00	
1278	Cooperstown to Cooperstown Junction.	Cooperstown and Susquehanna Valley.	16		12	1,000 00		62 50	
1279	Chatham Village to Rutland, Vt Branch, North Bennington to State Line.	Central Vermont	111.3 2		6 6	14,032 50		125 00 60 00	
1280	Plattsburgh to Au Sable Forks	New York and Canada	23		6	1,150 00		50 00	
1283	Utica to Watertown	Utica and Black River	92.22		12	5,994 30		65 00	
1284	Cayuga to Ithaca	Cayuga	38.05		6	1,902 50		50 00	
1285	Sodus Point to Gorham Station	Sodus Point and Southern	34		6	1,700 00		50 00	
1286	Horseheads to Van Ettenville	Utica, Ithaca and Elmira	19.89		6	994 50		50 00	Pay estimated.
1287	Oswego to Charlotte	Rome, Watertown and Ogdensburgh.	69.64		6	3,482 00		50 00	Do.
1288	Carthage to Clayton Branch, Theresa to Redwood	Utica and Black River	18 18.75 6.1		12 6 6	2,142 50		50 00	Pay on branch estimated.
1289	Freeville to Scipio	Utica, Ithaca and Elmira	28.82		6	1,441 00		50 00	
1290	Buffalo to Dayton	Buffalo and Jamestown	39.13		6	1,956 00		50 00	
1291	Golden's Bridge to Mahopac	New York and Harlem	7.5		6	375 00		50 00	Old rate of pay.
1292	Crawford Junction to Pine Bush	New Jersey Midland	10.18		6	509 00		50 00	
1293	Ithaca to Geneva	Geneva, Ithaca and Athens	40.25		6	2,535 75		63 00	
1294	Watertown to Sackett's Harbor	Watertown and Sackett's Harbor	12.5		6	625 50		50 00	Pay estimated.
1295	New York to Babylon	Southern Railroad Company of Long Island.	36.25		12	4,668 75		75 00	$1,950 per annum included as estimated pay for terminal and side service.
1296	New York to Patchogue Branch, Flushing to Whitestone Branch, Bayside to Manhasset	Flushing, North Shore and Central	59.21 3.12 3.03		12 12 12	8,502 00		75 00	$3,600 per annum included as estimated pay for terminal and side service.
1802	Quaker Street to Schenectady	Delaware and Hudson Canal Com-	15		12	750 00		50 00	Pay estimated.
1803	Nineveh Junction								

	NEW JERSEY.								
2101	New York to Easton, Pa	Central Railroad Company of New Jersey.	74		19	22,200 00		300 00	
2102	Somerville to Flemington	do	16.06		6	690 00		42 96	
2103	New York to West Philadelphia, Pa. Branch, Princeton Junction to Princeton. Branch, Frankford Junction to Kensington Station.	Pennsylvania	90 3.2 2.95		74 12 24	56,955 60		628 00 55 00 88 00	
2105	Philadelphia to South Amboy Branch, Bordentown to Trenton	do	66 6		8¾ 8¾	4,260 00		60 00 50 00	
2106	New York to Easton, Pa	Morris and Essex	63 24.4		12 6	7,520 00		100 00 50 00	Old rate of pay.
2107	Camden to Atlantic City	Camden and Atlantic	60			3,600 00		60 00	18 times a week 4 months, 12 times a week 8 months.
2108	New York to Nyack, N. Y	Northern Railroad Company of New Jersey.	30		6	2,158 00		50 00	$658 per annum included for side service.
2109	Philadelphia to Hightstown Branch, Burlington to Mount Holly.	Pennsylvania	25 27.5 7		12 6 6	3,725 00		75 00 40 00 50 00	$400 per annum included for mail-messenger service at Philadelphia. $600 per annum included for mail-messenger service at Philadelphia.
2110	Philadelphia to Bridgeton	West Jersey	18 20.4		18 12	4,824 00		110 00	
2111	Glassborough to Millville	do	22		12	2,200 00		100 00	
2112	Millville to Cape May	do	41		12	3,075 00		75 00	
2113	Elmer to Salem	do	16.6		12	1,000 00		60 24	
2114	Mount Holly to Medford	Pennsylvania	6.5		12	325 00		50 00	
2115	Jamesburgh to Squam Village	Freehold, Jamesburgh and Agricultural.	27		12	1,892 13		66 37½	$100 per annum included for side service.
2116	Trenton to intersection with Delaware, Lackawanna and Western Railroad.	Pennsylvania	68.7		20¼	5,496 00		80 00	
2117	Lambertville to Flemington	do	12.13		12	606 50		50 00	
2118	Greensburgh Station to New Brunswick.	do	29.13		12	1,456 00		50 00	Pay estimated.
2119	New York to New Bridge	New Jersey and New York	16.5		6	825 00		50 00	
2120	New Bridge to Nanuet Junction, N. Y.	do	13.25		6	662 50		50 00	
2121	Waterloo to Franklin Furnace. Branch, La Fayette Junction to Branchville.	Sussex	12 12.76 6.24		12 6 6	1,650 00		50 00	$100 per annum included for side service.
2122	New York to Denville	Delaware, Lackawanna and Western.	35.93		12	1,796 50		50 00	
2123	Dover to Chester	Morris and Essex	10		6	500 00		50 00	
2124	Newark to Mont Clair	Newark and Bloomfield	5.67		12	275 00		48 57	
2125	Rocky Hill to Monmouth Junction	Pennsylvania	8		6	400 00		50 00	

B.—*Railroad service as in operation on the 30th of June*, 1875—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	NEW JERSEY.—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
2126	Sandy Hook to Pemberton Junction.	New Jersey Southern	41.2		12	5,866 70		67 00	
			23.9		6			67 00	
	Branch, Eatontown to Port Monmouth.		9.8		12			50 00	
	Branch, Manchester to Barnegat Junction.		20.3		12			50 00	
2127	Whiting to Atco	do	33.3		6	1,665 00		50 00	
2128	Newark to Paterson	Erie	13.12		6	656 00		50 00	
2129	Atsion to Greenwich	Vineland	44.25		6	1,770 00		40 00	
2130	Whiting to Long Beach	Tuckerton	29.56		6	1,584 25		50 00	$106.25 per annum included for 3 months' service on 8.5 miles.
			8.5		6				
2131	Kinkora to New Lisbon	Pennsylvania	14.41		6	576 40		40 00	
2133	Bridgeton to Port Norris	Bridgeton and Port Norris	20.24		6	1,257 20		30 00	$650 per annum included for mail-messenger service.
2134	Egg Harbor City to May's Landing.	Camden and Atlantic	7.43		12	371 50		50 00	
2135	Jersey City to Ringwood Furnace.	Mont Clair	35.9		6	1,436 00		40 00	
2136	Atco to Williamstown	Williamstown	9		6	270 00		30 00	
2149	Summit to Bernardsville	New Jersey West Line	14.6		6	730 00		50 00	
2209	Woodbury to Swedesborough	West Jersey	11		6	550 00		50 00	
2254	New York to Middletown, N. Y.	New Jersey Midland	88		6	7,304 00		83 00	
				1,301.43			152,129 28		
	PENNSYLVANIA.								
2401	Philadelphia to Pittsburgh	Pennsylvania	353.6		40⅔	154,876 80		438 00	
2402	Philadelphia to Reading	Philadelphia and Reading	92.5		14⅓	11,562 50		125 00	
2403	Philadelphia to West Chester	West Chester and Philadelphia	26.13		18	2,062 50		75 00	$102.75 per annum included for side service.
2404	Philadelphia to Bethlehem	North Pennsylvania	54.6		45¼	6,496 00		110 00	
	Branch, Lansdale to Doylestown		9.8		18			50 00	
2405	Philadelphia to Norristown	Philadelphia and Reading	16.24		12	893 20		55 00	
2406	Philadelphia to Darby	Philadelphia and Darby	5		6	500 00		100 00	
2407	Bridgeport to Downingtown	Philadelphia and Reading	21.16		6	644 10		30 00	
2408	Chester to Port Deposit, Md	Philadelphia and Baltimore Central.	59.25		12	4,858 50		82 00	

2410	Allentown to Waverly	Lehigh Valley	105		10	[illegible]		115 00 105 00	
2411	Penn Haven Junction to Mount Carmel.	do	50		9½	2,500 00		50 00	
2412	Penn Haven Junction to Audenried.	do	17.5		12	1,312 50		75 00	
2413	Pottsville to Herndon	Philadelphia and Reading	81.1		10½	4,460 50		55 00	
2414	Port Clinton to Williamsport	do	121.53		7	7,291 80		60 00	
2415	Sunbury to Tomhicken	Pennsylvania	44.1		6	2,381 40		54 00	
2416	Hazel Creek Bridge to Tomhicken.	Lehigh Valley	13.8 11.4		13 13	2,028 00		85 00 75 00	
2417	Scranton to Northumberland	Lackawanna and Bloomsburgh	80		7½	7,200 00		90 00	
2418	Scranton to Carbondale	Delaware and Hudson Canal and Railroad Company.	17.11		12	1,200 00		50 00	$344.50 per annum included for mail-messenger service.
2419	Binghamton, N. Y., to New Hampton, N. J.	Delaware, Lackawanna and Western.	144.5		9¾	12,282 50		85 00	
2420	Blossburgh to Corning, N. Y Branch to Fall Brook Branch to Morris Run Branch to Arnot	Tioga	39.88 6.85 3.8 3.79		12 12 6 6	3,713 00		75 00 50 00 50 00 50 00	Old rate of pay.
2421	Williamsport to Elmira, N. Y	Northern Central	78		12	13,650 00		175 00	Do.
2422	Sunbury to Erie	Pennsylvania	39.8 247.8		18 18	36,010 20		195 00 114 00	
2423	Sunbury to Mount Carmel	Northern Central	28		10	1,400 00		50 00	
2424	Alton to Carrollton	Erie	25.5		6	1,020 00		40 00	
2425	Irvine to Corry	Allegheny Valley	95		12	6,365 00		67 00	
2426	Strasburgh to Leaman Place	Herr & Company	4.25		6	250 00		58 53	
2427	Lancaster to Middletown	Pennsylvania	31.2		15	2,184 00		70 00	
2428	Harrisburgh to Auburn	Philadelphia and Reading	58.3		7⅞	2,915 00		50 00	
2429	New Castle to Homewood	Pittsburgh, Fort Wayne and Chicago.	15		6	750 00		50 00	Old rate of pay.
2430	Harrisburgh to Martinsburgh, W. Va.	Cumberland Valley	18.5 44.75 30.75		18 12 6	7,300 00			52 miles at $100. 22 miles at $50. 20 miles estimated at $50.
2431	Columbia to Sinking Spring Branch Junction to Quarryville	Reading and Columbia	39.7 23.2		8⅞ 12	3,145 00		50 00 50 00	Pay on 15.4 miles of branch estimated.
2432	York to Columbia	Pennsylvania	13.5		6	675 00		50 00	
2433	Hanover Junction to Frederick, Md.	Hanover Branch	50.4		7½	2,520 00		50 00	
2434	Hanover to Gettysburgh	do	17.5		12	1,050 00		60 00	
2435	Huntingdon to Mount Dallas Station. Branch, Saxton to Dudley	Huntingdon and Broad Top	44 6		6 6	3,000 00		60 00 60 00	
2436	Tyrone to Clearfield	Pennsylvania	40.6		12	2,639 00		65 00	
2437	Altoona to Martinsburgh Branch, Duncansville to Newry Branch, Martinsburgh Junction to Henrietta.	do	22.3 3 6.7		10½ 6 6	1,600 00		50 00	
2438	Cresson to Ebensburgh	do	11		12	550 00		50 00	

B.—*Railroad service as in operation on the 30th of June*, 1875—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	PENNSYLVANIA—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
2439	Tyrone to Lock Haven	Pennsylvania	55.1		12	3,605 75		62 50	
	Branch, Milesburgh to Bellefonte.		2.7		12			60 00	
2440	Blairsville to Allegheny	do	63.7		9½	4,140 50		65 00	
2441	Washington to Wheeling, W. Va.	Hempfield	32		12	2,137 00		55 00	$377 per annum included for side-service.
2442	Pittsburgh to Oil City	Allegheny Valley	132.71		18	13,271 00		100 00	
2443	Branch Junction to Indiana	Pennsylvania	19		12	1,140 00		60 00	
2444	Meadville to Oil City	Atlantic and Great Western	36.25		9	2,265 62		62 50	
2445	Miles' Grove to New Castle	Erie and Pittsburgh	83		12	6,640 00		80 00	Old rate of pay.
2446	Oil City to Ashtabula, Ohio	Lake Shore and Michigan Southern	87.09		6	4,354 50		50 00	
2447	Bethlehem to Chapman Quarries	Lehigh and Lackawanna	15		12	750 00		50 00	
2448	Downingtown to Honey Brook	Pennsylvania	18		6	900 00		50 00	
2449	West Chester to Intersection, Pennsylvania Railroad.	West Chester	9		6	250 00		27 77	
2450	Lewistown Junction to Milroy	Pennsylvania	12.5		12	625 00		50 00	
2451	Pottsville to Frackville	Philadelphia and Reading	8.51		10½	425 50		50 00	
2452	Greenville to Harrisville	Shenango and Allegheny	33.5		6	2,010 00		60 00	
2453	Carlisle to Mountain Creek	South Mountain Iron Company	18		6	450 00		25 00	
2454	Freeport to Butler	Pennsylvania	21.3		12	1,065 00		50 00	
2455	Wilmington, Del., to Reading, Pa.	Wilmington and Reading	72.6		6	3,630 00		50 00	
2456	Pittsburgh to Washington	Pittsburgh, Cincinnati and Saint Louis.	22.8		12	1,482 00		65 00	
2457	Perkiomen Junction to Pennsburgh	Philadelphia and Reading	23.72		6½	1,067 40		45 00	
2458	Pottstown to Colebrookdale	do	13.05		6	522 00		40 00	
2459	Oleopolis to Pit-Hole City	Pit-Hole Valley	7		6	210 00		30 00	
2460	Lebanon to Tower City	Philadelphia and Reading	43.1		7½	1,724 00		40 00	
2461	Towanda to Bernice	Sullivan and Erie Coal and Railroad Company.	29.32		6	1,172 80		40 00	Old rate of pay.
2462	Schuylkill to Glen Carbon	Philadelphia and Reading	13.2		12	528 00		40 00	
2463	Topton to Kutztown	do	4.36		9	218 00		50 00	
2464	Pittsburgh to Cumberland, Md.	Pittsburgh and Connellsville	147.8		12	13,661 00		85 00	
	Branch, Broad Top to Mount Pleasant.		9		12			50 00	
	Branch, Connellsville to Uniontown.		12		12			54 00	

2465	*Carbondale to Susquehanna Depot.*	*Erie*	38.25		6	1,912 50		50 00	
2466	*Lawrenceville to Antrim*	*Fall Brook Coal Company*	37.1		12	2,442 50		65 83½	Old rate of pay.
2467	*Phœnixville to Eagle*	*Philadelphia and Reading*	11.12		6	556 00		50 00	
2468	*Lewisburgh to Laurelton*	*Pennsylvania*	20.73		12	1,350 80		60 00	$107 per annum included for mail-messenger service.
2469	Lewistown Junction to Sunbury	do	45		6	1,800 00		40 00	
2470	Union City to Titusville	Allegheny Valley	14.1		6	705 00		50 00	
2471	Towanda to Barclay	Towanda Coal Company	12		6	480 00		40 00	
2472	Shaff's Bridge to Somerset	Somerset and Mineral Point	9.1		12	655 00		50 00	$200 per annum included for mail-messenger service.
2474	Marion Junction to Richmond Furnace.	Cumberland Valley	19.13		6	1,072 00		50 00	
	Branch, Mercersburgh Junction to Mercersburgh.		2.31		6				
2475	Mount Dallas Station to New Bridgeport.	Pennsylvania	32		7	1,600 00		50 00	
2476									
2477	Allentown to Harrisburgh	Philadelphia and Reading	90		21	20,880 00		232 00	$145 per annum included for mail-messenger service.
2479	Conshohocken to Flourtown	do	7.25		6	362 50		30 00	
2480	Easton to Allentown	Lehigh Valley	16.58		36	4,078 68		246 00	
2482	Red Bank Furnace to Driftwood	Allegheny Valley	109.95		6	5,497 50		50 00	
2483	Chambersburgh to Mont Alto	Mont Alto	14.75		6	590 00		40 00	
2484	Tunkhannock to Montrose	Montrose	25.24		6	1,009 60		40 00	
2485	Lawrenceville to Elkland	Fall Brook Coal Company	13.08		12	654 00		50 00	
2486	Mechanicsburgh to Dillsburgh	Dillsburgh and Mechanicsburgh	8.85		6	442 50		50 00	Pay estimated.
	Pittsburgh to Monongahela City	Pittsburgh, Virginia and Charleston	31.84		9	2,133 28		67 00	
2487	Valley Junction to Ebbvale, Md	Bachman Valley	13.3		6	399 00		30 00	
2488	Pomeroy to Delaware City, Del	Pennsylvania and Delaware	38.58		6	1,543 20		40 00	
2489	Hollidaysburgh to Royer	Pennsylvania	21.35		6	1,067 50		50 00	Pay estimated.
2490	Mount Union to Broad Top	East Broad Top Railroad and Coal Company.	32.23		6	1,611 50		50 00	Do.
2491	Pollock to Karnes City	Parker and Karnes City	10		12	600 00		60 00	
2492	Antestown to Lloydville	Bell's Gap	8.82		6	441 10		50 00	Pay estimated.
2493	Phillipsburgh to Morrisdale Mines	Pennsylvania	4		6	200 00		50 00	Do.
2494	Reading to Slatington	Berks County	42.32		6	2,116 00		50 00	Do.
2495	Berlin to Garrett	Buffalo Valley	8.62		12	431 00		50 00	
2496	York to Muddy Creek Forks	Peach Bottom	22.09		6	1,104 50		50 00	Pay estimated.
2497	Lawsonham to Sligo	Allegheny Valley	10.47		6	418 80		40 00	
2498	Oxford to Goshen	Peach Bottom	16.75		6	837 50		50 00	Pay estimated.
2499	Pittsburgh to Castle Shannon	Pittsburgh and Castle Shannon	7		6	350 00		50 00	Do.
				4,322.43			463,253 83		
	DELAWARE.								
3401	Wilmington to Delmar	Philadelphia, Wilmington and Baltimore.	84		12	14,815 50		157 00	
			13.02		12			125 00	
3402	Delmar to Crisfield, Md	Eastern Shore Railroad Company of Maryland.	38		6	2,470 00		65 00	
3403	Clayton to Oxford, Md	Maryland and Delaware	44		6	2,797 50		52 50	Pay estimated.
			9.75		6			50 00	
3404	Harrington to Lewes	Junction and Breakwater	40		6	2,000 00		50 00	

B.—*Railroad service as in operation on the 30th of June*, 1875—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	DELAWARE—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
3405	Wilmington to Landenburgh, Pa.	Wilmington and Western	19.53		6	781 20		40 00	
3406	Georgetown to Selbyville	Breakwater and Frankford	19.3		6	965 00		50 00	Pay estimated.
				267.6			23,829 20		
	MARYLAND.								
3501	Baltimore to Philadelphia	Philadelphia, Wilmington and Baltimore.	96		28½	51,848 00		538 00	
	Branch, Perryville to Port Deposit.		4		6			50 00	
3502	Baltimore to Sunbury, Pa	Northern Central	140		18	28,560 00		204 00	
3503	Baltimore to Washington, D. C	Baltimore and Ohio	40		48	15,000 00		375 00	
3504	Washington, D. C., to Wheeling, W. Va.	do	254		18	123,120 00		360 00	
			99		18			320 00	
3505	Araby to Frederick	do	3		12	300 00		100 00	
3506	Weverton to Hagerstown	do	24.25		12	1,285 25		53 00	
3507	Baltimore to Williamsport	Western Maryland	85.5		12	6,657 30		75 00	
			6.12		12			40 00	
3508	Annapolis to Annapolis Junction	Annapolis and Elk Ridge	20.5		12	1,537 50		75 00	
3509	Cambridge to Seaford, Del	Dorchester and Delaware	33.5		6	1,675 00		50 00	
3510	Salisbury to Berlin	Wicomico and Pocomoke	23		6	1,150 00		50 00	
3511	Townsend, Del., to Centreville, Md	Queen Anne and Kent	36		6	1,800 00		50 00	
3512	Cumberland to Piedmont, W. Va.	Cumberland and Pennsylvania	34		6	1,700 00		50 00	
3513	Massey's Cross-Roads to Chestertown.	Kent County	19.55		6	1,466 25		75 00	
3514	Baltimore to Washington, D. C	Baltimore and Potomac	42.6		6	4,260 00		100 00	
3515	Bowie to Pope's Creek	do	48.68		6	2,434 00		50 00	
3516	Newtown Junction to Newtown	Worcester and Somerset	9		6	450 00		50 00	
3517	Berlin to Snow Hill	Worcester	14		6	700 00		50 00	
3518	Saint Denis to Point of Rocks	Baltimore and Ohio	60		6	6,000 00		100 00	
3519	Lake Roland to Western Maryland Railroad Junction.	Northern Central	8.5		6	425 00		50 00	Pay estimated.
				1,101.2			250,368 30		
	WEST VIRGINIA.								

	VIRGINIA.								
4401	Game Point to Richmond	Richmond, Fredericksburgh and Potomac.	75.5		13	20,007 50		265 00	
4403	Alexandria to Lynchburgh	Orange, Alexandria and Manassas.	178		14	44,950 00		250 00	
	Branch, Warrenton Junction to Warrenton.		9		14			50 00	
4404	Alexandria to Round Hill	Washington and Ohio	52.74		6	2,637 00		50 00	
4405	Manassas to Strasburgh	Orange, Alexandria and Manassas.	60		6	3,600 00		60 00	
4406	Richmond to Hinton, W. Va	Chesapeake and Ohio	272.58		6	24,532 00		90 00	
4407	Richmond to Greensborough, N. C.	Richmond and Danville	190.5		14	32,385 00		170 00	
4408	Richmond to West Point	Richmond and York River	40		6	2,000 00		50 00	
4409	Richmond to Petersburgh	Richmond and Petersburgh	24.5		14	5,050 00		200 00	$150 per annum included for mail-messenger service.
4410	Petersburgh to Weldon, N. C.	Petersburgh and Weldon	65.51		14	13,102 00		200 00	
4411	Petersburgh to City Point	Atlantic, Mississippi and Ohio	12		6	600 00		50 00	
4412	Petersburgh to Norfolk	do	81.5		6	4,890 00		60 00	
4413	Petersburgh to Lynchburgh	do	123		6	7,795 00		65 00	
4414	Lynchburgh to Bristol, Tenn	do	205		14	49,200 00		240 00	
4415	Portsmouth to Weldon, N. C	Seaboard and Roanoke	80		6	6,000 00		75 00	
4781	Glade Spring to Saltville	Atlantic, Mississippi and Ohio	9.5		6	285 00		30 00	
4782	Lynchburgh to Danville	Orange, Alexandria and Manassas.	67.28		6	3,364 00		50 00	Pay estimated.
4785	Chester to Winterpock	Richmond and Petersburgh	18.5		6	925 00		50 00	Do.
				1,565.11			221,522 50		
	NORTH CAROLINA.								
5001	Raleigh to Weldon	Raleigh and Gaston	97		7	7,275 00		75 00	
5002	Weldon to Wilmington	Wilmington and Weldon	163		13	28,886 00		172 00	
	Branch, Rocky Mount to Tarborough.		17		7			50 00	
5003	Wilmington to Monroe	Carolina Central	164		6	9,020 00		55 00	
5004	Goldsborough to Charlotte	Richmond and Danville	93		12	21,494 25		126 00	
			130.35		12			75 00	
5005	Goldsborough to Morehead City	Atlantic and North Carolina	95		7	5,225 00		55 00	
5006	Salisbury to Old Fort	Western North Carolina	114		6	5,700 00		50 00	
5007	Charlotte to Buffalo Paper Mills	Carolina Central	52.5		6	2,625 00		50 00	
5213	Charlotte to Statesville	Atlantic, Tennessee and Ohio	48.4		6	1,936 00		40 00	
5216	Raleigh to Sanford	Raleigh and Augusta Air-Line	45.78		6	2,426 34		53 00	
5216	Sanford to Fayetteville	Western	38.15		6	1,907 50		50 00	
5216	Sanford to Egypt Depot	do	7		2	147 00		21 00	
5280	Greensborough to Salem	Northwestern	29.31		6	1,465 50		50 00	
				1,094.49			88,107 59		

B.—*Railroad service as in operation on the 30th of June*, 1875—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	SOUTH CAROLINA.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
5601	Charlotte, N. C., to Augusta, Ga.	Charlotte, Columbia and Augusta	195		13	24,375 00		125 00	
5602	Columbia to Greenville C. H.	Greenville and Columbia	143.5		6	11,400 00		75 00	
	Branch, Hodges to Abbeville C. H.		11.5		6			30 00	
	Branch, Belton to Anderson C. H		9.75		6			30 00	
5604	Columbia to Wilmington, N. C.	Wilmington, Columbia and Augusta.	82.08		14	25,211 50		100 00	
			109.7		14			155 00	
5605	Kingsville to Augusta, Ga	South Carolina	129.28		13	18,176 10		70 00	
	Branch, Kingsville to Camden		37.95		13			50 00	
	Branch, Kingsville to Columbia		30.7		13			70 00	
	Branch, Branchville to Charleston		63.5		13			80 00	
5606	Charleston to Savannah, Ga.	Savannah and Charleston	104		13	11,544 00		111 00	
5607	Charleston to Florence	Northeastern	104		13	13,000 00		125 00	
5608	Florence to Cheraw	Cheraw and Darlington	40		7	2,000 00		50 00	
5609	Chester C. H. to Yorkville	King's Mountain	23.5		6	1,175 00		50 00	
5610	Alston to Spartanburgh C. H	Spartanburgh and Union	68.75		6	3,437 50		50 00	
5611	Newberry C. H. to Laurens C. H.	Joseph Crews	31.52		3	1,200 00		38 07	
5612	Anderson C. H. to Walhalla	Greenville and Columbia	34		6	1,360 00		40 00	
5707	Port Royal to Augusta, Ga.	Port Royal	112.28		7	5,614 00		50 00	
				1,331.01			118,493 10		
	GEORGIA.								
6001	Augusta to Atlanta	Georgia	171.666		13	21,458 33		125 00	
6002	Atlanta to Chattanooga, Tenn	Western and Atlantic	138.75		7	28,443 75		205 00	
6003	Atlanta to West Point	Atlanta and West Point	86.25		7	10,781 25		125 00	
6004	Millen to Augusta	Central Railroad and Banking Company.	53.125		14	6,640 62		125 00	
6005	Washington to Double Wells	Georgia	18.5		7	925 00		50 00	
6006	Union Point to Athens	do	41		7	3,315 00		75 00	$240 per annum included for mail-messenger service.
6007	Kingston to Rome	Rome	20.5		7	1,025 00		50 00	
6008	Savannah to Live Oak, Fla	Atlantic and Gulf	180.75		7	23,350 00		100 00	
	Branch, Du Pont to Bainbridge		105.5		7			50 00	
6009	Savannah to Macon	Central Railroad and Banking Company.	192.125		21	21,133 75		110 00	
6010	Macon to Columbus	Southwestern						[illegible]	

6017	Atlanta to Charlotte	Atlanta and Richmond Air-Line	266.5		7	20,650 00		100 00	
6088	Fort Valley to Perry	Southwestern	13.32		6	666 00		50 00	Pay estimated.
6143	Barnesville to Thomaston	Central Railroad and Banking Company.	17.25		6	690 00		40 00	
6144	Cartersville to Rock Mart	Cherokee	22		6	660 00		30 00	
6145	Camak to Macon	Macon and Augusta	79		6	4,266 00		54 00	
6146	Griffin to Carrollton	Savannah, Griffin and North Alabama.	61		6	1,830 00		30 00	
6191	Brunswick to Albany	Brunswick and Albany	171.25		3	5,137 50		30 00	
6231	Columbus to Hamilton	North and South	23.51		6	1,057 95		45 00	
				2,324.435			200,904 75		
	FLORIDA.								
6401	Fernandina to Cedar Keys	Atlantic, Gulf and West India Transit Company.	47.4 107.4		12 6	7,740 00		50 00	Old rate of pay.
6402	Jacksonville to Chattahoochee River. Branch, Tallahassee to Saint Mark's.	Jacksonville, Pensacola and Mobile.	215.75 21.75		6 3	20,070 00		90 00 30 00	
6404	Pensacola to Whiting Junction, Ala.	Pensacola and Louisville	44		7	2,200 00		50 00	
6405	Tocoi to Saint Augustine	Saint John's	15.69		6	784 50		50 00	
6406	Pensacola to Millview	Pensacola and Perdido	10.62		6	318 75		30 00	
				462.61			31,113 25		
	ALABAMA.								
6601	Montgomery to West Point, Ga.	Western Railroad Company of Alabama.	85.5		6	11,062 50		125 00	
6602	Montgomery to Selma	do	50		6	2,500 00		50 00	
6603	Montgomery to Eufaula	Montgomery and Eufaula	81.24		6	4,062 00		50 00	
6604	Montgomery to Decatur	South and North Alabama	63.8 119.05		7 7	16,425 25		117 50 75 00	
6605	Memphis, Tenn., to Stevenson, Ala. Branch, Moscow, Tenn., to Somerville. Branch, Tuscumbia to Florence	Memphis and Charleston	271.5 14.5 6.5		13 6 7	46,915 00		170 00 30 00 50 00	
6606	Marion Junction to Greensborough	Selma, Marion and Memphis	37.25		6	1,862 50		50 00	
6607	Opelika to Columbus, Ga	Western Railroad Company of Alabama.	28		6	2,100 00		75 00	
6608	Columbus, Ga., to Troy, Ala	Mobile and Girard	90		6	4,500 00		50 00	

B.—*Railroad service as in operation on the 30th of June, 1875*—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	ALABAMA—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
6609	Selma to York Station	Alabama Central	81.7		7	4,575 20		56 00	
6610	Selma to Dalton, Ga	Selma, Rome and Dalton	237.5		6	23,750 00		100 00	
6611	Gainesville to Gainesville Junction, Miss.	Mobile and Ohio	22		6	1,100 00		50 00	Old rate of pay.
6612	Mobile to Montgomery	Mobile and Montgomery	179		7	26,850 00		150 00	
6613	Mobile to New Orleans, La	New Orleans, Mobile and Texas	140		14	18,200 00		130 00	
6614	Opelika to Buffalo	East Alabama and Cincinnati	22.5		6	675 00		30 00	Old rate of pay.
6615	Chattanooga, Tenn., to Meridian, Miss.	Alabama and Chattanooga	290		7	15,370 00		53 00	
6616	Opelika to Good Water	Savannah and Memphis	47.28 12.49		6 6	2,863 60		50 00 40 00	
6617	Selma to Pine Apple	Selma and Gulf	43.19		6	2,159 50		50 00	
6618	Mobile to Bigbee Bridge	Mobile and Alabama Grand Trunk	59.7		6	2,001 00		30 00	Old rate of pay. $210 per annum included for mail-messenger service.
6619	Chehaw to Tuskegee	Tuskegee	6		6	300 00		50 00	
6620	Atalla to Gadsden	East Alabama and Cincinnati	6		6	300 00		50 00	Old rate of pay.
6621	Eufaula to Clayton	Vicksburgh and Brunswick	22.5		6	1,125 00		50 00	
				2,020.20			188,696 55		
	MISSISSIPPI.								
7001	Canton to Cairo, Ill	New Orleans, Saint Louis and Chicago.	342.98		13	68,596 00		200 00	Old rate of pay.
7002	Memphis, Tenn., to Grenada, Miss.	Mississippi and Tennessee	101.7		7	8,136 00		80 00	
7003	Vicksburgh to Meridian	Vicksburgh and Meridian	45.5 95.2		13 7	11,690 00		100 00 75 00	
7004	Mobile, Ala., to Columbus, Ky Branch, Artesia to Columbus, Miss	Mobile and Ohio	472.7 14		7 7	59,927 50		125 00 60 00	Old rate of pay.
7006	Grand Gulf to Port Gibson	Grand Gulf and Port Gibson	8		6	600 00		75 00	
7007	Muldon to Aberdeen	Mobile and Ohio	9		6	450 00		50 00	Old rate of pay.
7008	Middleton Station, Tenn., to Ripley, Miss.	Southern Railway Security Company.	24.3		6	972 00		40 00	
				1,113.38					

8001	New Orleans to Brashear	Morgan's Louisiana and Texas Railroad.	83		7	12,850 00		150 00	$400 per annum included for side supply.
8002	New Orleans to Canton, Miss	New Orleans, Saint Louis and Chicago.	206		13	41,200 00		200 00	
8003	Baton Rouge to Livonia	Baton Rouge, Grosse Tête and Opelousas.	28		3	360 00		12 86	
8004	Clinton to Port Hudson	Clinton and Port Hudson	21		3	630 00		30 00	
8005	Vicksburgh, Miss., to Monroe, La.	North Louisiana and Texas	75.5		7	6,162 50		75 00	$500 per annum included for ferriage and mail-messenger service.
8028	Saint Francisville to Woodville, Miss.	West Feliciana	27.57		3	964 95		35 00	
8090	New Orleans to Donaldsonville	New Orleans, Mobile and Texas	63.66		6	3,183 00		50 00	
8098	Terre Bonne to Houma	Morgan's Louisiana and Texas Railroad.	15.28		6	764 00		50 00	
				520.01			66,114 45		
	TEXAS.								
8502	Houston to Galveston	Galveston, Houston and Henderson	50		12	7,600 00		152 00	
8503	Houston to Denison City	Houston and Texas Central	211 126.55		13 7	51,645 15		153 00	
8504	Harrisburgh to Luling	Galveston, Harrisburgh and San Antonio.	84 71.2		6 6	8,400 00 3,560 00		100 00 50 00	Pay estimated.
8505	Hempstead to Austin	Houston and Texas Central	118.7		6	11,870 00		100 00	
8506	Shreveport, La., to Dallas, Tex	Texas and Pacific	189.2		6	15,136 00		80 00	
8514	Houston to Columbia	International and Great Northern	50		6	1,250 00		25 00	
8577a	Bremand to Waco	Houston and Texas Central	44.56		6	3,342 00		75 00	
8666	Palestine to Rockdale	International and Great Northern	121		6	6,050 00		50 00	
8683	Longview to Houston Branch, Mineola to Zavala Branch, Phelps to Huntsville	do	236 44.125 8.5		6 6 6	32,131 25		125 00 50 00 50 00	
8684	Indianola to Cuere	Gulf, Western Texas and Pacific	67.2		6	3,360 00		50 00	
8749	Marshall to Texarkana, Ark	Texas and Pacific	74		6	9,620 00		130 00	
8770	Sherman to Brookston	do	57		6	3,705 00		65 00	
				1,553.035			157,669 40		
	ARKANSAS.								
7501	Memphis, Tenn., to Argenta, Ark	Memphis and Little Rock	134		7	13,400 00		100 00	
7502a	Helena to Clarendon	Arkansas Central	48.2		6	2,169 00		45 00	
7525a	Chicot to Pine Bluff	Texas, Mississippi River and Northwestern.	72.78		3	3,275 10		45 00	
7645a	Chicot to Monticello	do	44.28		3	1,771 20		40 00	
				299.26			20,615 30		

B.—*Railroad service as in operation on the 30th of June,* 1875—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	KENTUCKY—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
20008	Bowling Green to Guthrie	Louisville and Nashville	51		13	7,956 00		156 00	
20009	Paducah to Trimble, Tenn	Paducah and Memphis	76.64		6	3,832 00		50 00	
20010	Evansville, Ind., to Guthrie, Ky	Saint Louis and Southeastern	110.66		7	11,951 28		108 00	
20011	Louisville to Paducah Branch, Cecilian to Elizabethtown	Louisville, Paducah and Southwestern.	226 6.19		6 6	14,860 16		64 00	
20012	Glasgow Junction to Glasgow	Louisville and Nashville	12		6	600 00		50 00	
20013	Anchorage to Shelbyville	Louisville, Cincinnati and Lexington.	19		6	950 00		50 00	Pay estimated.
20014	Willard to Greenup C. H	Eastern Kentucky	34.5		6	1,380 00		40 00	
20015	Owensborough to Owensborough Junction.	Evansville, Owensborough and Nashville.	36.13		6	1,806 50		50 00	
20016	Maysville to Paris	Maysville and Lexington	50		12	2,950 00		59 00	
20017	Lexington to Mount Sterling	Louisville, Cincinnati and Lexington.	33.84		6	1,692 00		50 00	
20018	Cincinnati Junction to Louisville and Nashville Junction.	do	4.13		6	206 50		50 00	Pay estimated.
				1,308.065			135,550 54		
	OHIO.								
9001	Bellaire to Columbus	Central Ohio	137.875		12	36,812 62		267 00	
9002	Pittsburgh, Pa., to Chicago, Ill	Pittsburgh, Fort Wayne and Chicago.	469.5		12	140,850 00		300 00	
9003	Rochester to Bellaire	Cleveland and Pittsburgh	68.75		18	6,875 00		100 00	
9005	Hudson to Columbus	Cleveland, Mount Vernon and Delaware.	145.88		6	17,067 96		117 00	
9006	Cleveland to Sharon, Pa	Atlantic and Great Western	49.75 31.61		6 6	6,555 50		100 00 50 00	
9007	Cleveland to Wellsville	Cleveland and Pittsburgh	56.5 45.86		18 12	15,558 72		152 00	
9008	Elyria to Millbury	Lake Shore and Michigan Southern	74.98		12	56,609 90		705 00	$50 per mile per annum included for additional daily line of postal cars.
9009	Bayard to New Philadelphia	Cleveland and Pittsburgh	32.5		6	1,625 00		50 00	
9010	Oneida Mills to Carrollton	Carrollton and Oneida	12		6	500 00		41 66	

28020	Pierce City to Brownsville, Kans.	Memphis, Carthage and Northwestern.	48.31		6	2,415 50		50 00	
28021	Mexico to Cedar City	Chicago and Alton	50.62		6	2,531 00		50 00	
28022	Roodhouse, Ill., to Mexico, Mo.	do	90		6	12,600 00		140 00	
28023	Cuba to Salem	Saint Louis, Salem and Little Rock	40.88		6	2,044 00		50 00	
28024	Holden to Paola, Kans.	Missouri, Kansas and Texas	55		6	2,750 00		50 00	Pay estimated.
28025	Salisbury to Glasgow	Keokuk and Kansas City	15.66		12	783 00		50 00	
				3,740.42			535,225 95		
	TENNESSEE.								
19002	Bristol to Chattanooga	East Tennessee, Virginia and Georgia.	242.7		14	62,068 80		244 00	
	Branch, Cleveland to Dalton, Ga.		28.5		7			100 00	
19003	Rogersville to Bull's Gap	Rogersville and Jefferson	15		6	790 00		52 66	
19004	Nashville to Chattanooga	Nashville and Chattanooga	114		13	24,925 00		145 00	
	Branch, Wartrace Depot to Shelbyville.		39		20			205 00	
			8		7			50 00	
19005	Fayetteville to Decherd	Memphis and Charleston	40		6	2,000 00		50 00	
19006	Nashville to Decatur, Ala	Louisville and Nashville	122.333		12	10,765 33		88 00	
19007	Nashville to Hickman, Ky	Nashville and Chattanooga	170.82		6	13,323 96		78 00	
19008	Nashville to Guthrie, Ky	Saint Louis and Southeastern	48		7	5,376 00		112 00	
19009	Guthrie, Ky., to Paris, Tenn.	Louisville and Nashville	82.5		13	12,622 50		153 00	
19010	Memphis to Paris	do	132.5		12	19,212 50		145 00	
19011	Knoxville to Careyville	Knoxville and Ohio	38.94		6	1,557 60		40 00	
19012	Morristown to River Side	Cincinnati, Cumberland Gap and Charleston.	39.8		6	1,592 00		40 00	
19013	Tracy City to Cowan	Tennessee Coal and Railroad Company.	23		6	920 00		40 00	
19014	Memphis to Covington	Paducah and Memphis	38.31		6	1,532 40		40 00	
19015	Jasper to Bridgeport, Ala	Nashville and Chattanooga	12		6	360 00		30 00	
19016	Nashville to Lebanon	Tennessee and Pacific	32.75		6	1,637 50		50 00	
				1,228.153			158,683 59		
	KENTUCKY.								
20001	Ashland to Coalton	Lexington and Big Sandy	11		6	325 00		29 54	Old rate of pay.
20002	Covington to Nicholasville	Kentucky Central	99		12			109 00	
			13		6	11,766 00		75 00	
20003	La Grange to Lexington	Louisville, Cincinnati and Lexington.	67		12	6,164 00		92 00	
20004	Cincinnati, Ohio, to Louisville, Ky	do	110.375		12	22,075 00		200 00	
20005	Louisville to Nashville, Tenn.	Louisville and Nashville	186.6		12	38,719 50		207 50	
20006	Bardstown Junction to Bardstown	do	17.3		6	692 00		40 00	
20007	Lebanon Junction to Fish Point.	do	109.9		6	7,624 60		54 00	
	Branch, Richmond Junction to Richmond.		33.8		6			50 00	

B.—*Railroad service as in operation on the 30th of June*, 1875—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	OHIO—Continued.								
			Miles.	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
9044	Marietta to Canal Dover	Marietta and Pittsburgh	99.96		6	4,998 00		50 00	
9045	Lorain to Uhricksville	Lake Shore and Tuscarawas Valley	102.45		6	5,122 50		50 00	
9046	Cleveland to Cincinnati	Cleveland, Columbus, Cincinnati and Indianapolis.	245.25		12	60,124 25		237 00	$50 per mile per annum, included for additional daily line of postal-cars.
9047	Mansfield to Toledo	Pennsylvania, lessees	88.1		6	5,286 00		60 00	
9048	Harbor to Youngstown	do	62.1		6	3,105 00		50 00	
9049	Toledo to Elkhart, Ind	Lake Shore and Michigan Southern	133.6		12	83,500 00		575 00	$50 per mile per annum included for additional daily line of postal-cars.
9050	Painesville to Niles	Painesville and Youngstown	50.74		6	2,029 60		40 00	
9051	Centreton to Chicago, Ill	Baltimore, Pittsburgh and Chicago.	273.72		6	27,372 00		100 00	Pay estimated.
9052	Dyson's to Cumberland	Eastern Ohio	7.8		6	390 00		50 00	Do.
				5,390.8			972,835 43		
	INDIANA.								
22001	Indianapolis to Vincennes	Indianapolis and Vincennes	116.32		6	5,816 00		50 00	
22002	Indianapolis to Terre Haute	Terre Haute and Indianapolis	73		21	15,184 00		208 00	
22003	Indianapolis to Cincinnati, Ohio	Indianapolis, Cincinnati and La Fayette.	113.5		18	30,418 00		268 00	
22004	Indianapolis to Peru	Indianapolis, Peru and Chicago	54 24		18 6	8,400 00		100 00	$600 per annum included for side service.
22005	Indianapolis to La Fayette	Indianapolis, Cincinnati and La Fayette.	65.625		18	17,193 75		262 00	
22006	Columbus to Madison	Jeffersonville, Madison and Indianapolis.	46		6	2,300 00		50 00	
22007	New Albany to Indianapolis	do	114		18	15,276 00		134 00	
22008	New Albany to Michigan City	Louisville, New Albany and Chicago.	61 227		12 6	14,400 00		50 00	Old rate of pay.
22009	Richmond to Chicago, Ill	Pittsburgh, Cincinnati and Saint Louis.	225.5		12	16,912 50		75 00	
22010	Cincinnati, Ohio, to East Saint Louis, Ill.	Ohio and Mississippi	72.4 268.6		19	88,424 00		279 00 254 00	
22011	Cambridge City to Columbus	Jeffersonville, Madison and Indianapolis.	68		6	2,720 00		40 00	

9011	Sandusky to Newark	Sandusky, Mansfield and Newark, (Baltimore and Ohio, lessees.)	110						
9012	Xenia to Dayton	Pittsburgh, Cincinnati and Saint Louis.	17		12	1,598 00		94 00	
9013	Springfield to Sandusky	Cincinnati, Sandusky and Cleveland.	131.35		12	13,135 00		100 00	
9015	Columbus to Delaware	Cleveland, Columbus, Cincinnati and Indianapolis.	24.75		24	2,970 00		120 00	
9016	Columbus to Xenia	Columbus and Xenia	55		6	11,550 00		210 00	
9017	Columbus to Indianapolis, Ind	Columbus, Chicago and Indiana Central.	188		12	31,208 00		166 00	
9018	Galion to Indianapolis, Ind	Cleveland, Columbus, Cincinnati and Indianapolis.	204		12	37,740 00		185 00	
9019	Blanchester to Hillsborough	Marietta and Cincinnati	21		6	1,701 00		81 00	
9020	Portsmouth to Reed's Mills	do	56		6	8,848 00		158 00	
9022	Toledo to Keokuk, Iowa	Toledo, Wabash and Western	256 198 44 4 22		12 12 6 6	123,466 00		273 00 225 00 62 00 90 00	Covered by other service.
9024	Fremont to Saint Mary's	Lake Erie and Louisville	89.35		6	4,467 50		50 00	
9025	Carey to Findlay	Cincinnati, Sandusky and Cleveland.	16		12	800 00		50 00	
9026	Dayton to Union City	Dayton and Union	48.17		6	2,890 20		60 00	
9027	Dayton to Toledo	Dayton and Michigan	71.43 71.53		18 12	21,444 00		150 00	
9028	Hamilton to Indianapolis, Ind	Cincinnati, Hamilton and Dayton	99.49		6	4,974 50		50 00	
9029	Hamilton to Richmond	Cincinnati, Richmond and Chicago.	45.1		6	5,321 80		118 00	
9030	Cincinnati to Dayton	Cincinnati, Hamilton and Dayton	26.53 33.92		43 31	10062 37		187 50 150 00	
9031	Cincinnati to Springfield	Pittsburgh, Cincinnati and Saint Louis.	65.96 19		13 6	14,801 60		210 00 50 00	
9032	Cincinnati to Parkersburgh, W. Va	Marietta and Cincinnati	206		6	76,838 00		373 00	
9033	Morrow to Dresden	Pittsburgh, Cincinnati and Saint Louis, lessees.	149.4		6	11,205 00		75 00	
9034	Dayton to Richmond	do	42		6	2,730 00		65 00	
9035	North Bend to Hagerstown, Ind	White Water Valley	72.58		6	4,536 24		62 50	
9036	Columbus to Pittsburgh, Pa Branch, Means to Cadiz	Pittsburgh, Cincinnati and Saint Louis.	160 8		12 12	37,200 00		230 00 50 00	
9037	Springfield to Columbus	Cincinnati, Sandusky and Cleveland.	45.86		6	2,293 00		50 00	
9038	Salamanca, N. Y., to Dayton, Ohio	Atlantic and Great Western	389.55		12	35,059 50		90 00	
9039	Youngstown to Cross-Cut	Pittsburgh, Fort Wayne and Chicago.	22.8		6	1,140 00		50 00	
9040	Columbus to Athens Branch, Logan to New Straitsville.	Columbus and Hocking Valley	77.4 13.02		12 12	7,293 30		87 50 40 00	
9041	Niles to New Lisbon	Atlantic and Great Western, lessees	33.94		6	1,697 00		50 00	
9042	Newark to Shawnee	Newark, Somerset and Straitsville	44.045		12	3,303 37		75 00	
9043	Clinton to Massillon	Cleveland, Mount Vernon and Delaware.	13.7		6	548 00		40 00	

B.—*Railroad service as in operation on the 30th of June*, 1875—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	OHIO—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
9044	Marietta to Canal Dover	Marietta and Pittsburgh	99.96		6	4,998 00		50 00	
9045	Lorain to Uhricksville	Lake Shore and Tuscarawas Valley	102.45		6	5,122 50		50 00	
9046	Cleveland to Cincinnati	Cleveland, Columbus, Cincinnati and Indianapolis.	245.25		12	60,124 25		237 00	$50 per mile per annum, included for additional daily line of postal-cars.
9047	Mansfield to Toledo	Pennsylvania, lessees	88.1		6	5,286 00		60 00	
9048	Harbor to Youngstown	do	62.1		6	3,105 00		50 00	
9049	Toledo to Elkhart, Ind	Lake Shore and Michigan Southern	133.6		12	83,500 00		575 00	$50 per mile per annum included for additional daily line of postal-cars.
9050	Painesville to Niles	Painesville and Youngstown	50.74		6	2,029 60		40 00	
9051	Centreton to Chicago, Ill	Baltimore, Pittsburgh and Chicago.	273.72		6	27,372 00		100 00	Pay estimated.
9052	Dyson's to Cumberland	Eastern Ohio	7.8		6	390 00		50 00	Do.
				5,390.8			972,835 43		
	INDIANA.								
22001	Indianapolis to Vincennes	Indianapolis and Vincennes	116.32		6	5,816 00		50 00	
22002	Indianapolis to Terre Haute	Terre Haute and Indianapolis	73		21	15,184 00		208 00	
22003	Indianapolis to Cincinnati, Ohio	Indianapolis, Cincinnati and La Fayette.	113.5		18	30,418 00		268 00	
22004	Indianapolis to Peru	Indianapolis, Peru and Chicago	54 24		18 6	8,400 00		100 00	$600 per annum included for side service.
22005	Indianapolis to La Fayette	Indianapolis, Cincinnati and La Fayette.	65.625		18	17,193 75		262 00	
22006	Columbus to Madison	Jeffersonville, Madison and Indianapolis.	46		6	2,300 00		50 00	
22007	New Albany to Indianapolis	do	114		18	15,276 00		134 00	
22008	New Albany to Michigan City	Louisville, New Albany and Chicago.	61 227		12 6	14,400 00		50 00	Old rate of pay.
22009	Richmond to Chicago, Ill	Pittsburgh, Cincinnati and Saint Louis.	225.5		12	16,912 50		75 00	
22010	Cincinnati, Ohio, to East Saint Louis, Ill. Bridge City to Columbus	Ohio and Mississippi Jeffersonville, Madison and Indianapolis.	72.4 [illegible]		19	88,424 00		279 00 254 00	
			68		6	2,[illegible]		[illegible]	

22016	Bradford, Ohio, to Logansport, Ind	Pittsburgh, Cincinnati and Saint Louis.	114.6	.....	6	5,730 00	.....	50 00	
22017	Indianapolis to Peoria, Ill	Indianapolis, Bloomington and Western.	212.2	.....	6	37,135 00	.....	175 00	
22018	Jeffersonville to North Vernon	Ohio and Mississippi	53.5	.....	18	9,362 50	.....	175 00	
22019	Fort Wayne to Connersville	Fort Wayne, Muncie and Cincinnati.	109	.....	6	6,322 00	.....	58 00	
22020	Richmond to Fort Wayne	Grand Rapids and Indiana	91.5	.....	6	4,575 00	.....	50 00	
22021	Marion to Goshen	Cincinnati, Wabash and Michigan	82	.....	6	4,100 00	.....	50 00	
22022	Princeton to Albion, Ill	Louisville, New Albany and Saint Louis Air Line.	31.03	.....	6	1,086 05	.....	35 00	
22023	Terre Haute to Danville, Ill	Evansville, Terre Haute and Chicago.	56.6	.....	6	2,830 00	.....	50 00	
22024	Indianapolis to Terre Haute	Indianapolis and Saint Louis	72	.....	18	14,112 00	.....	196 00	
22025	La Porte to Michigan City	Indianapolis, Peru and Chicago	12.36	.....	6	618 00	.....	50 00	
22026	Butler to Logansport	Detroit, Eel River and Illinois	94.5	.....	6	4,914 00	.....	52 00	
22027	Rockville to Logansport	Logansport, Crawfordsville and Southwestern.	92.1	.....	6	4,605 00	.....	50 00	
22028	La Fayette to Kankakee, Ill	Cincinnati, La Fayette and Chicago	75.75	.....	6	15,025 70	.....	262 00	18 miles covered by route No. 11916, (Illinois.)
22029	Terre Haute to Martz	Cincinnati and Terre Haute	26.15	.....	6	915 25	.....	35 00	
22030	Attica to Veedersburgh	Indiana North and South	14	.....	6	560 00	.....	40 00	
22031	Evansville to Boonville	Lake Erie, Evansville and Southwestern.	18	.....	6	900 00	.....	50 00	
22032	Frankfort to Kokomo	Frankfort and Kokomo	25.5	.....	6	1,275 00	.....	50 00	Pay estimated.
				3,015.235			353,774 75		
	ILLINOIS.								
23001	Chicago to Milwaukee, Wis	Chicago and Northwestern	87	.....	18	19,140 00	.....	220 00	
23002	Chicago to Freeport	do	92.5 28.5	.....	18 12	25,410 00	.....	210 00	
23003	Chicago to Council Bluffs, Iowa	do	98 392	.....	24 18	127,730 00	.....	255 00 275 00	For 351 miles. For 139 miles.
23004	Elgin to Geneva	do	44	.....	6	1,760 00	.....	40 00	
23005	Sterling to Alton Junction	Rockford, Rock Island and Saint Louis.	170 100.8	.....	12 18	21,664 00	.....	80 00	
23006	Sagetown to Keithsburgh	do	18	.....	6	540 00	.....	30 00	
23007	Chicago to Burlington, Iowa Branch, Aurora to Galena Junction. Branch, Galva to Keithsburgh	Chicago, Burlington and Quincy	207.7 13 59.3	.....	18 6 6	85,317 10	.....	273 00 50 00 50 00	$25,000 per annum included for Sunday service.
23008	Rushville to Yates City Branch, Elmwood to Buda	do	63.75 45	.....	6 6	6,525 00	.....	60 00	
23009	Peoria to Galesburgh	do	54	.....	6	8,370 00	.....	155 00	

B.—*Railroad service as in operation on the 30th of June, 1875*—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	ILLINOIS—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
23010	Galesburgh to Quincy	Chicago, Burlington and Quincy	100		18	19,000 00		190 00	
23011	Burlington, Iowa, to Quincy, Ill	do	71.85		6	5,388 75		75 00	
23012	Streator to Aurora Branch, Aurora to Batavia	do	60.79 9		6 6	4,187 40		60 00	
23013	Mendota to Clinton	do	64.19		6	3,209 50		50 00	
23014	Rock Falls to Cornton	do	47.23		6	1,889 20		40 00	
23015	Chicago to Davenport, Iowa	Chicago, Rock Island and Pacific	159 24		12	51,840 00		280 00 305 00	
23016	Bureau Junction to Peoria	do	47		6	4,230 00		90 00	
23017	Chicago to East Saint Louis	Chicago and Alton	283		12	55,185 00		195 00	
23018	Bloomington to Godfrey	do	111.4 40.6		12 12	18,948 00		130 00 110 00	
23019	Washington to Dwight Branch, Varna to Lacon	do	70.08 10.55		12 12	4,031 50		50 00	
23020	Chicago to Cairo	Illinois Central	55 310		12 12	73,375 00		235 00 195 00	
23021	Dubuque, Iowa, to Centralia, Ill	do	344		12	48,160 00		140 00	
23022	Joliet to Lake Station, Ind	Michigan Central	45		6	1,800 00		40 00	
23023	Decatur to East Saint Louis	Toledo, Wabash and Western	112		12	17,696 00		158 00	
23024	Pekin to Decatur	do	68.46		6	3,423 00		50 00	
23025	Hannibal, Mo., to Naples, Ill Branch, Mayaville to Pittsfield	do	45.5 6		6 6	4,281 25		87 50 50 00	
23026	La Fayette, Ind., to Bloomington, Ill.	do	116.43		6	5,821 50		50 00	
23027	State Line, Ind., to Warsaw, Ill	Toledo, Peoria and Warsaw	228.75		6	15,240 00		64 00	$60 per annum included for ferriage.
23028	Terre Haute, Ind., to East Saint Louis, Ill.	Indianapolis and Saint Louis	169		12	34,965 00		185 00	
23029	Urbana to Havana Branch, White Heath to Decatur	Indianapolis, Bloomington and Western.	102.7 32.35		6 6	5,402 00		40 00	
23030	East Saint Louis to Du Quoin	Saint Louis, Alton and Terre Haute	71.8		12	7,180 00		100 00	
23031	East Saint Louis to Terre Haute, Ind.	Terre Haute and Indianapolis, lessees.	165.4		22	30,433 60		184 00	
23032	Saint Louis, Mo., to Evansville, Ind. Branch, McLeansborough to Shawneetown.	Saint Louis and Southeastern	104.75 41.25		6 6	20,185 00		110 00 50 00	

23037	Vincennes, Ind., to Cairo, Ill	Cairo and Vincennes	158		6	11,000 00		70 00	
23038	Peoria to Jacksonville	Peoria, Pekin and Jacksonville	87.4		6	6,555 00		75 00	
23039	Carbondale to Grand Tower	Grand Tower Mining, Manufacturing and Transportation Company.	25		9	1,000 00		40 00	
23040	Peoria to Rock Island	Peoria and Rock Island	92		12	5,520 00		60 00	
23041	Quincy to Hannibal, Mo.	Quincy, Alton and Saint Louis	19.4		6	5,823 25		165 00	
	Branch, Fall Creek to Louisiana, Mo.		30.85		6			85 00	
23042	Chicago to Danville	Chicago, Danville and Vincennes	127		6	6,868 00		54 00	Pay for 108 miles; 19 miles covered by other service.
	Branch, Bismarck to Youngstown.		25.9		6			40 00	
23043	Streator to Altamont	Chicago and Paducah	156.8		6	6,431 00		50 00	Pay for 128.62 miles.
23044	Mattoon to Horvey City	Chicago and Illinois Southern	31.66		6	1,266 40		40 00	
23045	Carbondale to Marion	Carbondale and Shawneetown	18		6	720 00		40 00	
23046	Jacksonville to Virden	Jacksonville, Northwestern and Southeastern.	31.39		6	1,255 60		40 00	
23047	Chester to Tamaroa	Iron Mountain, Chester and Eastern.	42		6	2,100 00		50 00	
23048	Terre Haute, Ind., to Peoria, Ill	Illinois Midland	98.53		6	7,197 20		40 00	
			81.4		6				
23049	Springfield to Havana	Thompson, Griggs & Co., operating Springfield and Northwestern.	48.2		6	2,169 00		45 00	
23050	Hutsonville to Danville	Paris and Danville	72.1		6	3,605 00		50 00	
23051	Streator to Pekin	Chicago, Pekin and Southwestern	65.28		6	3,590 40		55 00	
23052	Courtland Station to Sycamore	Sycamore and Courtland	5		12	400 00		50 00	$150 per annum included for mail-messenger service.
23053	East Saint Louis to Cairo	Cairo and Saint Louis	148.5		6	7,425 00		50 00	
23054	Chicago to Elgin	Chicago and Pacific	39		6	1,560 00		40 00	
23055	Decatur to Montezuma	Indiana and Illinois Central	87		6	4,350 00		50 00	
23056	Geneva to Batavia	Chicago and Northwestern	3.51		6	140 40		40 00	
				6,676.34			852,985 90		
	MICHIGAN.								
24001	Toledo, Ohio, to Detroit, Mich	Lake Shore and Michigan Southern	65.27		6	8,158 75		125 00	
24002	Monroe to Adrian	do	35.23		6	2,642 25		75 00	
24003	Adrian to Jackson	do	47.25		6	2,362 50		50 00	
24004	White Pigeon to Grand Rapids	do	36.77		12	6,880 75		75 00	
			58.9		6			70 00	
24005	Detroit to Chicago, Ill	Michigan Central	284		33½	60,350 00		212 50	
24006	Detroit to Grand Haven	Detroit and Milwaukee	189.67		15	19,915 35		105 00	
24007	Detroit to Port Huron	Grand Trunk	64.5		12	5,353 50		83 00	
24008	Jackson to Fort Wayne, Ind	Fort Wayne, Jackson and Saginaw	96.82		6	5,518 74		57 00	
24009	Jackson to Otsego Lake	Michigan Central	228.4		9½	11,420 00		50 00	
24010	Jackson to Grand Rapids	do	94.86		6	7,114 50		75 00	

B.—*Railroad service as in operation on the 30th of June*, 1875—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	MICHIGAN—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
24012	Lenox to Romeo	Saint Clair and Chicago Air Line	16.13		6	806 50		50 00	
24013	Detroit to Bay City	Detroit and Bay City	108.97		12	7,409 96		68 00	
24015	Monroe to Ludington	Flint and Père Marquette	254.29		14½	25,924 04		96 00	
	Branch, Otter Lake Junction to Otter Lake.		14.53		14½			40 00	
	Branch, East Saginaw to Bay City.		12.75		14½			60 00	
	Branch, Saint Clair Junction to South Saginaw.		4.15		14½			40 00	
24017	Detroit to Howard City	Detroit, Lansing and Lake Michigan.	164.67		6	10,703 55		65 00	
24018	Fort Wayne, Ind., to Walton, Mich.	Grand Rapids and Indiana	260.55		7	13,027 50		50 00	
24019	Kalamazoo to South Haven	Michigan Central	39.74		6	1,987 00		50 00	
24020	Lansing to Fort Wayne Junction, Ind.	Chicago and Lake Huron	166.2		8¼	8,310 00		50 00	
24021	New Buffalo to Pent Water	Chicago and Michigan Lake Shore	170.56		13½	16,000 66		86 00	
	Branch, Holland to Grand Rapids.		26.65		6			50 00	
24022	Port Huron to Flint	Chicago and Lake Huron	66.59		6	3,329 50		50 00	
24023	Allegan to Muskegon	Michigan Lake Shore	58.37		6	2,918 50		50 00	
24024	Ypsilanti to Banker's	Detroit, Hillsdale and Indiana	65.54		6	2,949 30		45 00	
24025	Jackson to Niles	Michigan Central	104.57		6	5,228 50		50 00	
24026	Grand Rapids to Newaygo	Grand Rapids, Newaygo and Lake Shore.	36.27		6	1,813 50		50 00	
24027	Niles to South Bend	Michigan Central	12.2		6	610 00		50 00	
24028	Jonesville to Lansing	Lake Shore and Michigan Southern	60.87		6	3,043 50		50 00	
24030	East Saginaw to Saint Louis	Saginaw Valley and Saint Louis	35.19		9	1,407 60		40 00	
24031	Fort Howard to Ishpeming	Chicago and Northwestern	181.2		6	15,402 00		85 00	
24032	Muskegon to Big Rapids	Chicago and Michigan Lake Shore	56.64		6	1,699 20		30 00	
24033	Ionia to Stanton	Detroit, Lansing & Lake Michigan	25.31		6	1,012 40		40 00	
24034	Walton to Traverse City	Continental Improvement Comp'y.	26.26		6	1,444 30		55 00	
24035	Toledo, Ohio, to Detroit Mich	Toledo, Canada Southern and Detroit.	56.37		6	4,847 82		86 00	
24036	Grosse Isle to Fayette	Chicago and Canada Southern	70.3		6	3,515 00		50 00	Pay estimated.
24037	Saint Clair to Richmond	Michigan, Midland and Canada	16.76		6	838 00			

	WISCONSIN.								
25001	Milwaukee to North McGregor, Iowa.	Chicago, Milwaukee and Saint Paul.	197.2		12	24,650 00		125 00	
25002	Milwaukee to La Crosse	do	198		12	45,540 00		230 00	
25003	Milwaukee to Berlin	do	94.8		12	8,532 00		90 00	
25004	Milton Junction to Monroe	do	42.8		6	2,140 00		50 00	
25005	Watertown to Madison	do	38.45		12	3,845 00		100 00	Old rate of pay.
25006	Horicon to Portage City	do	45.25		6	2,262 50		50 00	
25007	Nepeuskun to Winneconne	do	16.25		6	650 00		40 00	
25008	Oshkosh to Ripon	do	21		6	1,050 00		50 00	
25009	Chicago, Ill., to Green Bay, Wis.	Chicago and Northwestern	245		14½	51,450 00		210 00	
25010	Caledonia Station, Ill., to Winona Junction, Wis.	do	135.45 54.9		6 6	14,001 75		75 00 70 00	
25011	Kenosha to Rockford, Ill	do	73.6		6	5,520 00		75 00	
25012	Winona, Minn., to Winona Junction, Wis.	do	28		12	5,852 00		209 00	
25013	Racine to Rock Island Junction, Ill.	Western Union	189.4		12	13,258 00		70 00	
25014	Elroy to Saint Paul, Minn Branch, Stillwater Junction to Stillwater.	West Wisconsin	198.4 3.25		12 6	19,937 50		100 00 30 00	
25015	Green Bay to Winona, Minn	Green Bay and Lake Pepin	216.51		6	10,820 50		50 00	
25016	Milwaukee to Green Bay Branch, Hilbert to Menasha	Wisconsin Central, operated by the Phillips and Colby Construction Company.	111.54 16		12 12	10,585 82		83 00	
25017	Menasha to Worcester	do	65.27 48.93 49.9		6 6 6	8,023 10		70 00 40 00 30 00	
25018	Milwaukee to Two Rivers Branch, Manitowoc to Appleton	Milwaukee, Lake Shore and Western.	85 44.5		6 6	7,475 00		67 00 40 00	
25019	Sheboygan to Princeton	Sheboygan and Fond du Lac	79.05		6½	4,012 50		50 00	$60 per annum included for mail-messenger service.
25020	Warren to Mineral Point	Mineral Point	33		6	1,650 00		50 00	
25021	Calamine to Platteville	do	18.7		6	935 00		50 00	
25022	Tomah to Wausau	Wisconsin Valley	90.04		6	4,502 00		50 00	
25023	Madison to Portage City	Chicago and Superior	39.5		6	1,975 00		50 00	
25024	Milwaukee to Fond du Lac	Chicago and Northwestern	63.53		6	4,320 04		68 00	
25025	Galena, Ill., to Platteville, Wis.	Galena and Southern Wisconsin	30.69		6	1,534 50		50 00	Pay estimated.
25026	Chippewa Falls to Eau Claire	Chippewa Falls and Western	11.67		6	583 50		50 00	Do.
				2,585.48			255,105 71		
	IOWA.								
27001	Burlington to Plymouth	Burlington, Cedar Rapids and Minnesota.	228		6	17,100 00		75 00	
27002	Cedar Rapids to Postville	do	99.8		6	4,990 00		50 00	
27003	Cedar Rapids to Traer	do	24.77		6	990 80		40 00	
27004	Muscatine to Riverside	do	32.23		6	1,289 20		40 00	

B.—*Railroad service as in operation on the 30th of June*, 1875—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	IOWA—Continued.		*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
27005	Burlington to East Plattsmouth Branch, Red Oak to Eastport	Burlington and Missouri River	279.14 50		12 6	58,828 00		200 00 60 00	
27006	Chariton to Leon	do	37.44		6	1,872 00		50 00	
27007	Creston to Hopkins, Mo	do	44.4		6	2,664 00		60 00	
27008	Viele Junction to Unionville, Mo	Burlington and Southwestern	104.75		6	5,447 00		52 00	
27009	Villisca to Clarinda	Burlington and Missouri River	16		6	800 00		50 00	
27010	Albia to Northwood	Central Railroad Company of Iowa	189.2		6	9,460 00		50 00	
27011	Keokuk to Burlington	Chicago, Burlington and Quincy	42.75		6	3,420 00		80 00	
27012	Clinton to La Crescent Junction, Minn.	Chicago, Dubuque and Minnesota	179.77		6	10,786 20		60 00	
27013	Stanwood to Tipton	Chicago and Northwestern	8.81		6	440 50		50 00	
27014	Davenport to Missouri River	Chicago, Rock Island Pacific	54 264		6 6	80,850 00		275 00 250 00	
27015	Des Moines to Indianola Branch, Summerset Junction to Winterset.	do	21.4 27.1		6 6	2,425 00		50 00	
27016	Washington to Sigourney	do	29		6	1,160 00		40 00	
27017	Wilton Junction to Leavenworth, Kans.	do	322.77		6	19,366 20		60 00	
27018	Davenport to Maquoketa	Davenport and Saint Paul	42.76		6	2,138 00		50 00	
27019	Keokuk to Des Moines	Keokuk and Des Moines	162		12	13,608 00		84 00	
27020	Farley to Cedar Rapids	Dubuque and Southwestern	55.37		6	2,768 50		50 00	
27021	Dubuque to Sioux City	Illinois Central	327.12		12	35,001 84		107 00	
27022	Waterloo to Mona	do	80		6	5,040 00		63 00	
27023	Beulah to Elkader	Iowa Eastern	17.75		6	887 50		50 00	
27024	Clinton to Anamosa	Iowa Midland	74.1		6	2,964 00		40 00	
27025	Calmar to Algona	Chicago, Milwaukee and Saint Paul.	127.8		6	7,284 60		57 00	
27026	Conover to Decorah	do	9.5		12	522 50		55 00	
27027	Davenport to Fayette	Davenport and Saint Paul	129.33		6	6,595 83		51 00	
27028	Sabula to Marion	Chicago, Milwaukee and Saint Paul.	87.75		6	4,387 50		50 00	
	Missouri Valley to Sioux City California Junction to	Sioux City and Pacific	76 83.4		6 6	10,630 00		85 00 50 00	
		Des Moines and Minnesota	37.12		6	1,856 00		50 00	
				3,365.33			315,573 17		

46014	Goshen to Delano	Southern Pacific	41.3		7	3,097 50		75 00	
46015	Elmira to Vacaville	Vaca Valley	4		12	200 00		50 00	
46016	Saucelito to Tomales	North Pacific Coast	49.18		6	2,459 00		50 00	Pay estimated.
				1,807.79			271,998 80		
	OREGON.								
44001	Portland to Roseburgh	Oregon and California	198.81		6	19,881 00		100 00	
44002	Portland to Saint Joseph	Oregon Central	48.61		6	2,430 50		50 00	Pay estimated.
				247.42			22,311 50		
	WASHINGTON TERRITORY.								
43001	Kalama to New Tacoma	Northern Pacific	105.6		6	6,336 00		60 00	
				105.6			6,336 00		
	DAKOTA TERRITORY.								
35001	Sioux City, Iowa, to Yankton, Dak	Dakota Southern	61.48		6	4,918 40		80 00	
				61.48			4,918 40		
	UTAH TERRITORY.								
41001	Ogden City to Wood's Crossing	Utah Central	36.5		6	2,920 00		80 00	
41002	Salt Lake City to Provo City	Utah Southern	49		6	2,450 00		50 00	Pay estimated.
41003	Ogden City to Franklin	Utah Northern	85.25		7	4,262 50		50 00	
				170.75			9,632 50		
	COLORADO TERRITORY.								
38001	Denver to Pueblo	Denver and Rio Grande	119		7	10,580 00		70 00	
	Branch, Pueblo to Cañon City		45		7			50 00	
38003	Hughes' Station to Boulder	Denver and Boulder Valley	27.75		6	2,081 25		75 00	
38004	Denver to Black Hawk	Colorado Central	38.5		7	4,460 00		60 00	
	Branch, Golden Junction to Longmont.		39		7			50 00	
	Branch, Forks of Clear Creek to Floyd's Hill.		4		7			50 00	
38005	Kit Carson to West Las Animas	Arkansas Valley	56		7	2,800 00		50 00	Pay estimated.
				329.25			19,921 25		

JAS. N. TYNER,
Second Assistant Postmaster-General.

B.—*Railroad service as in operation on the 30th of June*, 1875—Continued.

Number of route.	State and termini.	Corporate title of company carrying the mail.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Annual cost per mile on each route.	Remarks.
	KANSAS—Continued.								
			Miles.	*Miles.*		*Dollars.*	*Dollars.*	*Dollars.*	
33003	Lawrence to Coffeyville Branch, Cherry Vale to Independence.	Leavenworth, Lawrence and Galveston.	142.9 10		6 6	11,859 10		79 00 57 00	
33004	Elwood to Hastings, Nebr.	Saint Joseph and Denver City	227.2		6	13,177 60		58 00	
33005	Kansas City, Mo., to Baxter Springs, Kans.	Missouri River, Fort Scott and Gulf.	160.2		13	15,379 20		96 00	
33006	Junction City to Parsons	Missouri, Kansas and Texas	156.5		6	9,077 00		58 00	
33007	Atchison to Granada Branch, Newton to Wichita	Atchison, Topeka and Santa Fé	481.24 27.09		6 6	37,989 30		75 00 70 00	
33008	Kansas City, Mo., to Ottawa, Kans	Leavenworth, Lawrence and Galveston.	33.3		6	2,797 20		84 00	19.7 miles covered by other service.
33009	Atchison to Lincoln, Nebr.	Atchison and Nebraska	152.28		7	9,136 80		60 00	
33010	Leavenworth to Holton	Kansas Central	56.5		6	2,825 00		50 00	
33012	Junction City to Clay Centre	Junction City and Fort Kearney	33.85		6	2,031 00		60 00	
33013	Topeka to Kansas City, Mo	Kansas Midland	26.5		6	1,325 00		50 00	38.5 miles covered by other service; pay estimated.
				2,385.56			260,117 20		
	NEVADA.								
45001	Virginia City to Reno	Virginia and Truckee	51.75		6	2,587 50		50 00	Pay estimated.
				51.75			2,587 50		
	CALIFORNIA.								
46001	San Francisco to Ogden City, Utah	Central Pacific	877.5		7	204,457 50		233 00	
46002	San Francisco to Soledad Branch, Gilroy to Tres Pinos	Southern Pacific	143.3 20.2		14 7	12,474 00		80 00 50 00	
46003	Roseville to Redding	Central Pacific, (Oregon division)	105 47		7 7	15,475 00		125 00 50 00	Old rate of pay. Pay estimated.
46004	Folsom City to Shingle Springs	Placerville and Sacramento Valley	26		7	1,300 00		50 00	Old rate of pay.
46005	Sacramento City to Folsom City	Sacramento Valley	23.2		12	1,450 00		62 50	
46006	Sacramento City to San Francisco	California Pacific	83		14	7,553 00		91 00	
46007	Davisville to Grafton	do	18.2		6	910 00		50 00	
46008	Napa Junction to Calistoga	do	36		6	1,800 00		50 00	
46009	Marysville to Oroville	California Northern	30		6	1,500 00		50 00	
46010	Lathrop to Goshen	Central Pacific	144.91		6	11,592 80		80 00	
46011	San Francisco to Cloverdale	San Francisco and North Pacific	88		6	4,400 00		50 00	Old rate of pay.

46014	Goshen to Delano	Southern Pacific	41.3		7	3,097 50		75 00	
46015	Elmira to Vacaville	Vaca Valley	4		12	200 00		50 00	
46016	Saucelito to Tomales	North Pacific Coast	49.18		6	2,459 00		50 00	Pay estimated.
				1,807.79			271,998 80		
	OREGON.								
44001	Portland to Roseburgh	Oregon and California	198.81		6	19,881 00		100 00	
44002	Portland to Saint Joseph	Oregon Central	48.61		6	2,430 50		50 00	Pay estimated.
				247.42			22,311 50		
	WASHINGTON TERRITORY.								
43001	Kalama to New Tacoma	Northern Pacific	105.6		6	6,336 00		60 00	
				105.6			6,336 00		
	DAKOTA TERRITORY.								
35001	Sioux City, Iowa, to Yankton, Dak	Dakota Southern	61.48		6	4,918 40		80 00	
				61.48			4,918 40		
	UTAH TERRITORY.								
41001	Ogden City to Wood's Crossing	Utah Central	36.5		6	2,920 00		80 00	
41002	Salt Lake City to Provo City	Utah Southern	49		6	2,450 00		50 00	Pay estimated.
41003	Ogden City to Franklin	Utah Northern	85.25		7	4,262 50		50 00	
				170.75			9,632 50		
	COLORADO TERRITORY.								
38001	Denver to Pueblo	Denver and Rio Grande	119		7	10,580 00		70 00	
	Branch, Pueblo to Cañon City		45		7			50 00	
38003	Hughes' Station to Boulder	Denver and Boulder Valley	27.75		6	2,081 25		75 00	
38004	Denver to Black Hawk	Colorado Central	38.5		7	4,460 00		60 00	
	Branch, Golden Junction to Longmont.		39		7			50 00	
	Branch, Forks of Clear Creek to Floyd's Hill.		4		7			50 00	
38005	Kit Carson to West Las Animas	Arkansas Valley	56		7	2,800 00		50 00	Pay estimated.
				329.25			19,921 25		

JAS. N. TYNER,
Second Assistant Postmaster-General.

C.—*Steamboat service as in operation on the 30th of June, 1875.*

Number of route.	State and termini.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Remarks.
	NEW HAMPSHIRE.	*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	
316	Alton Bay to Wolfborough	10		6	1,200 00		During navigation, say 7 months.
	Centre Harbor to Meredith Village	20		3			
321	Weir's Bridge to Wolfborough	30		6	650 00		Do.
			60			1,850 00	
	MASSACHUSETTS.						
688	Wood's Hole to Nantucket	30		6	2,500 00		
			30			2,500 00	
	RHODE ISLAND.						
811	Fall River, Mass., to New York, N. Y	186			10,000 00		Six times a week 9 months; seven times a week 3 months.
826	Newport to Wickford	12		12	6,000 00		
			198			16,000 00	
	NEW YORK.						
1389	Ticonderoga to Rouse's Point	108		11	4,984 62		
1694	Geneva to Watkins	65		6	3,200 00		Includes all side-service.
1790	Lake George to Ticonderoga	40		6	350 00		June 15 to September 30.
			213			8,534 62	
	NEW JERSEY.						
2105	New York to South Amboy	27		12	1,620 00		
2126	New York to Sandy Hook	19½		12	1,306 50		
2253	New York to Keyport	22			576 28		Six times a week 8 months; three times a week 4 months.
			68½			3,502 78	
	PENNSYLVANIA.						
2501	Monongahela City to Greensborough	52¼			3,369 94		Six times a week 8 months; three times a week 4 months.
			52¼			3,369 94	
	MARYLAND.						
3521	Baltimore to Queenstown	40		6	750 00		
3966	Baltimore to Pitt's Wharf	150			5,400 00		Four times a week 8 months, to Crisfield, 108 miles; twice a week 4 months, 8 months, residue [illegible] months.
			190			6,150 00	

	KENTUCKY.						
20096	Louisville to Cincinnati, Ohio	143	.....	6	9,000 00	.....	
20097	Louisville to Evansville, Ind	202	.....	6	15,000 00	.....	
20098	Evansville, Ind., to Cairo, Ill	202	.....	6	15,000 00	.....	
20099	Bowling Green to Evansville, Ind	225	.....	2	4,800 00	.....	
20100	Paducah to Eastport, Miss	265	.....	2	6,000 00	.....	
			1,037			49,800 00	
	OHIO.						
9061	Portsmouth to Cincinnati	127¾	.....	3	4,500 00	.....	
9062	Cincinnati to Marysville, Ky	65½	.....	3	2,000 00	.....	
9063	Portsmouth to Huntington	51.35	.....	6	7,300 00	.....	
	Huntington to Gallipolis	36.65	.....	3			
			281¼			13,800 00	
	MICHIGAN.						
24094	Manistee to Milwaukee, Wis	160	.....	6	4,160 00	.....	May 1 to December 1.
24095	Detroit to Mackinaw	317	.....	3	610 00	.....	July 1 to close of navigation, 61 trips, at $10 per round trip.
24096	Detroit to Sault de Sainte Marie	350	.....	3	1,000 00	.....	May, June, and November.
24097	Bay City to Alpena	143	.....	6	9,000 00	.....	April 16 to November 14.
24098	Cheboygan to Alpena	100	.....	1	590 00	.....	May 1 to November 14.
24099	Grand Haven to Milwaukee, Wis	85	.....	6	2,340 00	.....	May 1 to October 31.
			1,155			17,700 00	
	WISCONSIN.						
25365	Washington Harbor to Green Bay	96	.....	1	65 00	.....	May 1 to November 30.
			96			65 00	
	CALIFORNIA.						
46101	San Francisco to Portland, Oreg	670	.....	.....	25,000 00	.....	Four times a month.
46102	San Francisco to Sacramento City	230	.....	6	8,000 00	.....	
46273	San Francisco to San Quentin	12	.....	7	1,200 00	.....	
46275	Tahoe City to Tahoe City	100	.....	6	1,200 00	.....	May 1 to October 31.
			1,012			35,400 00	
	OREGON.						
44101	Portland to Astoria	120	.....	6	14,906 83	.....	
44102	Portland to The Dalles	120	.....	6	15,535 00	.....	
			240			30,441 83	
	WASHINGTON TERRITORY.						
43101	Olympia to Victoria	174	.....	.....	24,313 00	.....	Three times a week to Seattle, 66 miles; twice a week, residue, 108 miles.
43108	Seattle to Schome	143	.....	1	3,600 00	.....	
43115	Port Townsend to Semiahmoo	129	.....	1	4,900 00	.....	
43132	Portland, Oreg., to Sitka, Alaska Territory	1,400	.....	.....	34,800 00	.....	Once a month.
			1,846			67,613 00	

JAS. N TYNER,
Second Assistant Postmaster-General.

C.—*Steamboat service as in operation on the 30th of June*, 1875—Continued.

Number of route.	State and termini.	Distance.	Total distance in each State.	Number of trips per week.	Annual pay.	Annual pay in each State.	Remarks.
	LOUISIANA.	*Miles.*	*Miles.*		*Dollars.*	*Dollars.*	
8006	Vicksburgh, Miss., to New Orleans, La	408	.....	3	29,980 00	.....	
8007	Brashear to New Iberia	70	.....	6	12,500 00	.....	
8010	New Orleans to Pilot Town	117	.....	3	10,896 00	.....	
8011	New Orleans to Covington	48	.....	3	4,500 00	.....	
8014	New Orleans to Saint Francisville	170	.....	2	18,000 00	.....	
8103	New Orleans to Grand Isle	96	.....	.....	2,300 00	.....	Twice a week 4 months; once a week 8 months.
8114	Lake Charles to Leesburgh	50	.....	2	4,880 00	.....	
8117	New Orleans to Red River Landing	210	.....	3	5,775 00	.....	
8128	New Orleans to Hope Villa	119	.....	2	2,000 00	.....	
			1,288			90,831 00	
	TEXAS.						
8507	Galveston to Brashear, La	220	.....	.....	50,000 00	.....	Three times a week 6 months; six times a week 6 months.
8508	Galveston to Indianola	130	.....	.....	10,000 00	.....	Twice a week 4 months; three times a week 8 months.
8510	Galveston to Liberty	98	.....	2	8,000 00	.....	
8685	Orange to Weiss Bluff	150	.....	2	9,750 00	.....	
8771	Brashear, La., to Brazos Santiago, Tex	465	.....	.....	4,800 00	.....	Twice a month.
			1,063			82,550 00	
	ARKANSAS.						
7504	Memphis, Tenn., to White River, Ark	180	.....	3	21,500 00	.....	
7505	White River to Vicksburgh, Miss	229	.....	3	27,000 00	.....	
7506	White River to Pine Bluff	182½	.....	2	10,990 00	.....	
7509	White River to Jacksonport	356	.....	2	5,000 00	.....	
7648	Memphis, Tenn., to Friar's Point, Ark	112	.....	3	2,500 00	.....	
			1,059½			66,990 00	
	MISSOURI.						
28100	Saint Louis to Memphis, Tenn	450	.....	3	41,000 00	.....	
			450			41,000 00	
	TENNESSEE.						
	[illegible] Court-House to King's Creek	49	.....	6	3,950 00	.....	
	[illegible] King's Creek	110	.....	2	2,093 34	.....	
			159			6,043 34	

20100	Paducah to Eastport, Miss	265		2	6,000 00		
			1,037			49,800 00	
	OHIO.						
9061	Portsmouth to Cincinnati	127¾		3	4,500 00		
9062	Cincinnati to Marysville, Ky	65½		3	2,000 00		
9063	Portsmouth to Huntington	51.35		6	7,300 00		
	Huntington to Gallipolis	36.65		3			
			281¼			13,800 00	
	MICHIGAN.						
24094	Manistee to Milwaukee, Wis	160		6	4,160 00		May 1 to December 1.
24095	Detroit to Mackinaw	317		3	610 00		July 1 to close of navigation, 61 trips, at $10 per round trip.
24096	Detroit to Sault de Sainte Marie	350		3	1,000 00		May, June, and November.
24097	Bay City to Alpena	143		6	9,000 00		April 16 to November 14.
24098	Cheboygan to Alpena	100		1	590 00		May 1 to November 14.
24099	Grand Haven to Milwaukee, Wis	85		6	2,340 00		May 1 to October 31.
			1,155			17,700 00	
	WISCONSIN.						
25365	Washington Harbor to Green Bay	96		1	65 00		May 1 to November 30.
			96			65 00	
	CALIFORNIA.						
46101	San Francisco to Portland, Oreg	670			25,000 00		Four times a month.
46102	San Francisco to Sacramento City	230		6	8,000 00		
46273	San Francisco to San Quentin	12		7	1,200 00		
46275	Tahoe City to Tahoe City	100		6	1,200 00		May 1 to October 31.
			1,012			35,400 00	
	OREGON.						
44101	Portland to Astoria	120		6	14,906 83		
44102	Portland to The Dalles	120		6	15,535 00		
			240			30,441 83	
	WASHINGTON TERRITORY.						
43101	Olympia to Victoria	174			24,313 00		Three times a week to Seattle, 66 miles; twice a week, residue, 108 miles.
43108	Seattle to Sehome	143		1	3,600 00		
43115	Port Townsend to Semiahmoo	129		1	4,900 00		
43132	Portland, Oreg., to Sitka, Alaska Territory	1,400			34,800 00		Once a month.
			1,846			67,613 00	

JAS. N TYNER,
Second Assistant Postmaster-General.

E.—*Table showing the weight of the mails, the speed with which they are conveyed, the accom-on railroad-routes in States in which the contract-term expired June* 30, 1875, *and also in other pay in accordance with the act of March* 3, 1873.

ABBREVIATIONS.—f. f., fixtures and furniture; f. f. c., fixtures and furniture complete; m. c., mail-line; r. a., route-agents; m. m., mail-messenger. A number followed by an asterisk (*) shows the the routes in this table.]

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Miles per hour.
						Miles.	
1	N. J ..	2103	.....	New York, New Brunswick	Pennsylvania	36	30
2	N. J	2103 2104	.....	New York, West Philadelphia.	.....do	90	30
3	N. J ..	2104	.....	New Brunswick, Philadelphia.	.....do	54	30
4	Conn .	907	.....	New Haven, New York.....	New York, New Haven and Hartford.	76¼	30
5	Md ...	3501	.....	Baltimore, Philadelphia.....	Philadelphia, Wilmington and Baltimore.	100	33
6	Conn .	905	.....	New Haven, Springfield ...	New York, New Haven and Hartford.	63 5-6	30
7	Conn .	907	.....	New Haven, New York	.....do	76¼	30
8	Conn .	905	.....	New Haven, Springfield	.....do	63 5-6	30
9	Ill ...	23015	23015	Chicago, Davenport.....	Chicago, Rock Island and Pacific	183	24
10	Ill	23007	23007	Chicago, Burlington	Chicago, Burlington and Quincy..	207 70	30
11	Mo ..	28001	28001	Saint Louis, Atchison.....	Atlantic and Pacific.....	329. 75	24
12	Ill ...	23003	23003	Chicago, Union Pacific Transfer.	Chicago and Northwestern.....	491	23
13	Iowa..	27014	27014	Davenport, Missouri River..	Chicago, Rock Island and Pacific	318	23
14	Mo ...	28005	28005	Quincy, Saint Joseph	Hannibal and Saint Joseph.....	203¼	22
15	Mo ...	28010	28010	Kansas City, Cameron	.....do	54	22
16	Wis ..	25002	25002	Milwaukee, La Crosse	Chicago, Milwaukee & Saint Paul	198	21
17	Ill	23001	23001	Chicago, Milwaukee	Chicago and Northwestern.....	87	22
18	Mo ...	10501	28001	Saint Louis, Atchison	Atlantic and Pacific, (lessees Pacific, of Missouri.)	329¾	24

‖ Wyoming Territory	[illegible]		[illegible]	[illegible]									[illegible]		[illegible]	
‖ Utah Territory	17			88,046					54		2,687			3,140		85,359
‖ Colorado Territory	227			52,043					83		4,456		132,847			47,587
‖ Indian Territory	412		14,909										95,264		14,909	
‖ New Mexico Territory	59			173,721										65,062		173,721
‖ Arizona Territory		49		29,454									46,072			29,454
Total	12,144	3,136	246,776	767,445	1,112	3,693	49,891	204,765	2,511	162	633,909	7,054	5,991,533	796,793	802,930	851,618
	3,136			246,776		1,112		49,891	162		7,054		796,793			802,930
Increase	9,008								2,349		626,855		5,194,740			
Decrease				520,669		2,581		154,874								48,688

* Corrected distance.

† Increased number of trips.

‡ Steamboat route from Galveston to Sabine Pass, 60 miles, at $5,000 per annum, transferred to "celerity, certainty, and security," and that from Brashear, La., to Brazos Santiago, Tex., 465 miles, twice a month, put in operation at $4,800 per annum.

‖ Close of the first year of the new contract term.

§ Decreased number of trips.

JAS. N. TYNER,
Second Assistant Postmaster-General.

E.—*Table showing the weight of the mails, the speed with which they are conveyed, the ac on railroad-routes in States in which the contract-term expired June* 30, 1875, *and also in pay in accordance with the act of March* 3, 1873.

ABBREVIATIONS.—f. f., fixtures and furniture; f. f. c., fixtures and furniture complete; m. c., line; r. a., route-agents; m. m., mail-messenger. A number followed by an asterisk (*) show the routes in this table.]

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Miles
						Miles.	
1	N. J	2103	.....	New York, New Brunswick	Pennsylvania	36	30
2	N. J	2103 2104	.....	New York, West Philadelphia.	.....do	90	30
3	N. J	2104	.....	New Brunswick, Philadelphia.	.....do	54	30
4	Conn	907	.....	New Haven, New York	New York, New Haven and Hartford.	76½	30
5	Md	3501	.....	Baltimore, Philadelphia	Philadelphia, Wilmington and Baltimore.	100	33
6	Conn	905	.....	New Haven, Springfield	New York, New Haven and Hartford.	63 5-6	30
7	Conn	907	.....	New Haven, New York	.....do	76½	30
8	Conn	905	.....	New Haven, Springfield	.....do	63 5-6	30
9	Ill	23015	23015	Chicago, Davenport	Chicago, Rock Island and Pacific	183	24
10	Ill	23007	23007	Chicago, Burlington	Chicago, Burlington and Quincy	207 70	30
11	Mo	28001	28001	Saint Louis, Atchison	Atlantic and Pacific	329.75	24
12	Ill	23003	23003	Chicago, Union Pacific Transfer.	Chicago and Northwestern	491	21
13	Iowa	27014	27014	Davenport, Missouri River	Chicago, Rock Island and Pacific	318	23
14	Mo	28005	28005	Quincy, Saint Joseph	Hannibal and Saint Joseph	203¼	24
15	Mo	28010	28010	Kansas City, Cameron	.....do	54	
16	Wis	25002	25002	Milwaukee, La Crosse	Chicago, Milwaukee & Saint Paul	198	
17	Ill	23001	23001	Chicago, Milwaukee	Chicago and Northwestern	87	
18	Mo	10501	28001	Saint Louis, Atchison	Atlantic and Pacific, (lessees Pacific, of Missouri.)	329¼	

ıtions for mails and agents, the trips per week, and the rates of pay per mile per annum, ɜs and Territories, the returns having been obtained with a view to the re-adjustment of the

ıers; r. p. o., railway post-office; apt., apartment; b. c., baggage-car; s. l., single line; d. l., double ·alent in round trips. The figures in parentheses in the "Remarks" column refer to the order of

ɔle weight carɜd any distance r thirty days.		Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Feet and inches.*				
28 1224225	3142653	2989719	33, 219	See below	74*	$567 00	90 days, from Nov. 2, 1874. Extra trips on local trains. (See 2.)	1
.....	.....	2956660	32, 852	r. p. o., 49.4 by 8.4, 49.3 by 8.4, 47.3 by 8.4, 46 by 8 8. f. f., d. l.; r. a. apts., 15.6 by 6.5½, (average,) f. f., d. l., and extra s. l. on local trains, 24.3 m.	74*	567 00	90 days, from Nov. 2, 1874. Extra trips on local trains. 54 m. at $558, route 2104. Main route; branches $55, (193.) and $88, (102.) Consolidated.	2
05 1206463	307976-	2938421	32, 649	See above	74*	558 00	90 days, from Nov. 2, 1874. Extra trips on local trains. (See 2.)	3
32 1267600	2676632	2511548	32, 617	r. p. o., 48 by 8.7, 25 by 8.10, f. f. c. and m. c., d. l.; r. a. apts., 15 by 6.8, 13.6 by 6.9, f. f. c. and m. c., 1½ l.; and r. a. in b. c., s. l.	40½*	479 00	77 days, from Jan. 1, 1875.	4
20 1724247	2757567	2263746	25, 152	r. p. o., 50 by 9, f. f., d. l.; r. a. apt., 24 by 9, f. f., s. l. to Wilmington, 69.7 m.; 3½ l. residue, 26.3 m.; and extra, in apt. 9 by 3.6, f. f., d. l., beyond Lamokin, 13.9 m.	31*	440 00	90 days, from Nov. 2, 1874. Main route; branch $50, (292.)	5
85 1336259	2315244	1940962	25, 207	r. p. o., 48 by 8.7, 25 by 8.10, f. f. c. and m. c., d. l.; r. a. apt., 9.3 by 6.4, f. f. c. and m. c., s. l; and r. a. in b. c., s. l.	34*	416 00	77 days, from Jan. 1, 1875.	6
74 435, 977	759, 851	700, 775	23, 359	r. p. o., 48 by 8 7, 25 by 8.10, f. f. c. and m. c., d. l.; r. a. apts., 15 by 6 8, 13.6 by 6.9, f. f. c. and m. c., 1½ lines; and r. a. in b. c., s. l.	37	375 00	In June, 1874.....	7
514 293, 367	629, 981	560, 842	18, 694	r. p. o., 48 by 8.7, 25 by 8.10, f. f. c. and m. c., d. l.; r. a. apt., 9.3 by 6.4, f. f. c. and m. c., s. l.; and r. a. in b. c., s. l.	34*	325 00	....do	8
566 105, 470	459, 036	375, 775	12, 525	r. p. o., (say) 40 by 10.2, f. f. c. and m. c., s. l. to Geneseo, 159 m.; d. l. residue, 24 m.	15¼*	280 00	24 miles at $305; r. p. o., with platforms, 48.6 by 10.2.	9
390 112, 066	479, 056	338, 001	11, 266	r. p. o., 55.6 by 9.6, f. f. c. and m. c., s. l.	21¼*	273 00	Main route; branches $50, (217,300:) special train every 3d Sunday.	10
730 91, 596	321, 326	157, 418	5, 247	r. p. o., 43.6 by 9.6., f. f. c. and m. c., s. l.	13⅜*	262 00	In April, 1875	11
524 145, 301	418, 825	253, 868	8, 462	r. p. o., 50 by 9.5, 35 by 9.4, (average 42.6 by 9.4½,) f. f., s. l.	13*	255 00	139 miles at $275; 1 mile increase.	12
75 96, 101	392, 076	262, 419	8, 747	r. p. o., (say) 40 by 10, f. f. c. and m. c., d. l. to Iowa City, 54 m., s. l. res., 264 m.	12	250 00	54 miles at $275; r. p. o., with platforms, 49.7 by 10.	13
731 72, 795	267, 526	186, 421	6, 214	r. p. o., 40 by 10, f. f. c., s. l. to Cameron, 171 m., b. c. res.	11⅜*	237 50	Main route; branch $75, (151.)	14
15 143, 834	193, 749	184, 936	6, 164	r. p. o., 40 by 10, f. f. c., s. l	13	232 00	.....	15
78 63, 503	251, 681	197, 440	6, 581	r. p. o., (say) 40 by 10.3, f. f. c., s. l.	12	230 00	r. p. o., with platforms, 46 6 by 10.3	16
41 55, 578	161, 419	128, 804	4, 293	r. p. o., 36 by 10, f. f., d. l ...	25	220 00	.....	17
25 140, 750	497, 775	240, 319	8, 010	r. p. o., 43.6 by 9.6, f. f. c. and m. c., s. l.	13¼*	215 00	In October, 1874; 44¼ miles at $100.	18

E.—*Table showing the weight of the mails, the speed with which they*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Miles per hour.
						Miles.	
19	Ill....	11419	23028	Terre Haute, East Saint Louis.	Indianapolis and Saint Louis ...	189	36
20	Mich	24005	24005	Detroit, Chicago.....	Michigan Central.....	284	24
21	Wis ..	25009	25009	Chicago, Green Bay.....	Chicago and Northwestern.....	245	22
22	Ill	23002	23002	Chicago, Freeport.....	.....do	121	22
23	Wis ..	25012	25012	Winona, Winona Junction..	.....do	30.45	20
24	Ind...	22002	.....	Indianapolis, Terre Haute ..	Terre Haute and Indianapolis....	73	34
25	Minn .	26013	26013	Saint Paul, Winona.....	Chicago, Milwaukee & Saint Paul	103.24	30
26	Ind...	12010	22010	Cincinnati, East Saint Louis	Ohio and Mississippi.....	341	25
27	Iowa..	27005	27005	Burlington, East Plattsmouth.	Burlington and Missouri River..	279.14	21
28	Ind...	12002	22002	Indianapolis, Terre Haute ..	Terre Haute and Indianapolis....	73	28
29	Va....	4409	11008	Richmond, Petersburgh.....	Richmond and Petersburgh	24.50	27
30	Miss..	7001	18001	Canton, Jackson	New Orleans, Saint Louis and Chicago.	237	20
31	La....	8002	30001	New Orleans. Canton	.....do	206	20
32	Miss..	7001	18001	Canton, Cairo	.....do	342.98	20
33	Va....	4410	11009	Petersburgh, Weldon.....	Petersburgh	65.51	20
34	Mass .	608	.....	Boston, Providence	Boston and Providence.....	44	26
35	Miss..	7001	18001	Jackson, Cairo.....	New Orleans, Saint Louis and Chicago.	105.98	20
36	Ill	23017	23017	Chicago, East Saint Louis...	Chicago and Alton.....	283	25
37	Ill	23020	23020	Chicago, Cairo	Illinois Central.....	365	21
38	Ill	23010	23010	Camp Point, Quincy	Chicago, Burlington and Quincy..	22	25
39	Ill	23010	23010	Galesburgh, Quincy.....	.....do	100	25
40	Ill	23010	23010	Galesburgh, Camp Point....	.....do	78	25
41	Ill	23010	23010	Galesburgh, Quincy....	.....do	100	25
42	Ill	23031	23031	East Saint Louis, Terre Haute.	Terre Haute and Indianapolis ...	165.4	34
43	Mo ...	28004	28004	Saint Louis, Kansas City ...	Saint Louis, Kansas City and Northern.	271.75	22
44	Ohio..	9032	.....	Cincinnati, Parkersburgh...	Marietta and Cincinnati	206	25
45	Ohio..	9001	.....	Bellaire, Columbus.....	Central Ohio	137¾	24
46	Ill	23035	23035	Chicago, Milwaukee	Chicago, Milwaukee and Saint Paul.	88.85	27
47	Ill	11425	23031	East Saint Louis, Terre Haute.	Terre Haute and Indianapolis....	165.40	28
48	Pa....	2421	.....	Williamsport, Elmira.....	Northern Central	78	20
49	Tex ..	8502	.....	Houston, Galveston.....	Galveston, Houston and Henderson.	50	30
50	Ill ...	23023	23023	Decatur, East Saint Louis ..	Toledo, Wabash, and Western	112	25

, *the accommodations for mails and agents, &c.*—Continued.

ht car-istance lays.	Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Total.	30 days, total.	Per day, total.					
Lbs.	*Lbs.*	*Lbs.*	*Feet and inches.*				
5 123, 985	79, 150	2, 638	r. p. o., 39.4 by 9, f. f., s. l ..	18	$215 00	In October, 1873.....	19
3 282, 757	138, 717	4; 623	r. p. o., 45 by 10, f. f., s. l ..	32½*	212 50	.....	20
2 271, 107	135, 231	4, 507	r. p. o., 50 by 10, f. f. c., s. l.	14½*	210 00	.....	21
7 158, 713	125, 536	4, 184	r. p. o., 35.8 by 9.5, f. f., s. l..	14*	210 00	.....	22
0 100, 842	98, 415	3, 280	r. p. o., 40 by 10, f. f., s. l.; r. a. apt., 12 by 9.6, f. f., s. l.	12	209 00	2.45 miles increase	23
0 198, 926	181, 624	6, 054	45 by 10, 19 by 7. 6, f. f. c., d. l.	22*	.08 00	Weighing voluntary; in March, 1875.	24
0 144, 484	110, 566	3, 685	r. p. o., (say) 40 by 10.3, f. f. c., s. l.	12	207 00	r. p. o., with platforms, 46.6 by 10 3.	25
1 326, 368	184, 091	6, 136	r. p. o., 50 by 9, f. f. and m. c., s. l., from Jan. 1, 1874; old style and size previously; r. p. o. add'l., 41 by 11, f. f., s. l, to North Vernon, 72.4 m., from Sept. 16, 1874.	16½*	200 00	In July, 1874	26
5 254, 696	176, 758	5. 891	r. p. o., 52.1 by 9.6., f. f. c., s. l.	12	200 00	Special train every 3d Sunday. Main route; branch $60. (180.)	27
6 161, 220	147, 400	4, 913	22 by 7.6, 11 by 7.6, f. f. c., d. l.	22*	200 00	In July, 1874	28
1 85, 832	84, 460	2, 815	r. p. o., 42 by —, f. f. c., d. l..	13	200 00	In June, 1875; $150 m. m.	29
9 364, 167	250, 688	2, 785	r. p. o., 42 by 9, f. f. c., s. l ..	13	200 00	90 days from Nov. 1, 1874. Part; see residue, (35.)	30
4 344, 150	213, 640	2, 373	r. p. o., 42 by 9, f. f. c., s. l...	13	200 00	90 days, from Nov. 1, 1874.	31
.....	208, 270	2, 31[illegible]	r. p. o, 42 by 9, f. f. c., s. l..	13	200 00	....do	32
9 72, 570	68, 160	2, 272	r. p. o., 43 by —, f. f. c., d. l..	13	200 00	In June, 1875	33
4 83, 948	53, 905	1, 796	No apt.; no r. a.....	20½*	200 00	Returns corrected, for Oct. 1873.	34
3 205, 569	115, 111	1, 279	r. p. o., 42 by 9, f. f. c., s. l..	13	200 00	90 days, from Nov. 1, 1874. Part; see residue, (30.) Pay on 21 miles, residue to be fixed.	35
9 254, 662	122, 759	4, 091	r. p. o., 45 by 9.10, f. f. c. and m. c., s. l.; r. a. apt., 18.6 by 10, f. f. c. and m. c., s. l., 28.8 miles.	18½*	195 00	.....	36
9 431, 671	108, 148	3, 604	r. p. o., 44 6 by 8.9, f. f. c. and m. c., d. l., to Kankakee, 55 m.; s. l., residue; r. a. apt., 12 by 8, s. l., to Kankakee.	15*	195 00	55 miles at $235	37
.....	236, 840	7, 894	r. p. o., 44.11 by 9.6, f. f. c. and m. c., s. l.	12	190 00	Part, lap; see residue, (40.)	38
6 258, 963	125, 224	4, 174	r. p. o., 44.11 by 9.6, f. f. c. and m. c., s. l.	12	190 00	With lap.....	39
.....	95, 174	3, 172	r. p. o., 44.11 by 9.6, f. f. c. and m. c., s. l.	12	190 00	Part; see residue, (38.)	40
0 116, 049	95, 041	3, 168	r. p. o., 44.11 by 9 6, f. f. c. and m. c., s. l.	12	190 00	Without lap	41
8 189, 391	161, 896	5, 396	45 by 10, f. f., s. l.; local mail-room, 19 by 7.6.	16*	184 00	.....	42
1 143, 984	69, 207	2, 306	24 by 7.6, f. f., s. l..	14½*	180 00	.....	43
3 532, 812	375, 370	12, 512	r. p. o., 52.4 by 9.6½, f. f., d. l	162*	175 00	In [illegible]gust, 1874.....	44
4 388, 918	215, 356	7, 178	r. p. o., 51.6 by 8.9, f. f., s. l	19	175 0[illegible]	[illegible]	45
8 187, 059	173, 341	5, 778	No r. a	18	17[illegible]	.....	46
8 151, 823	122, 419	4, 080	22 by 7.6, 11 by 7.6, f. f. c., s. l.	22*	175 00	In July, 1874	47
7 81, 0[illegible]9	63, 4[illegible]7	2, 115	r. p. o., 51 by 10, f. f. c., s. l.; r. a. apt., (average,) 14.6 by 8.6, s. l.	12	175 00	Weight in Oct., 1873; reported in July, 1875.	48
9 68, 139	64, 725	2, 157	15.10 by 6.9, f. f., s. l.....	18	160 00	In October, 1874	49
5 139, 410	128, 247	4, 274	20 by 9.4, f. f., s. l	12	158 00	.....	50

E.—*Table showing the weight of the mails, the speed with which they*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Miles per hour.
						Miles	
51	Ill ...	23009	23009	Peoria, Galesburgh	Chicago, Burlington and Quincy	54	36
52	Tex ..	8502	31001	Houston, Galveston	Galveston, Houston and Henderson.	50	19
53	N. C ..	5002	13002	Weldon, Wilmington	Wilmington and Weldon	163	22
54	S. C ...	5604	14002	Florence, Wilmington	Wilmington, Columbia and Augusta.	109. 7	25
55	La	8001	30003	New Orleans, Brashear	Morgan's Louisiana and Texas	83	21
56	Mo ...	28006	28006	Kansas City, Union Pacific Transfer.	Kansas City, Saint Joseph and Council Bluffs.	203½	...
57	Ill	23021	23021	Dubuque, Centralia	Illinois Central	344	20
58	Mo ...	28022	28022	Roadhouse, Mexico	Chicago and Alton	90	24
59	Mo ...	28003	28003	Pacific, Vinita	Atlantic and Pacific	327¼	22
60	Tex ..	8749	31010	Marshall, Texarkana	Texas and Pacific	74	18
61	Mass .	608	....	Boston, Providence	Boston and Providence	44	26
62	Mo ...	10502	28002	Argenta, Texarkana	Saint Louis and Iron Mountain and Cairo and Fulton.	144. 41	21
63	Ill	23018	23018	Bloomington, Godfrey	Chicago and Alton	152	24
64	N. C ..	5004	13004	Greensborough, Charlotte	Richmond and Danville	93	19
65	Ga	6002	15002	Atlanta, Chattanooga	Western and Atlantic	138. 75	25
66	Va ..	4407	11006	Richmond, Greensborough	Richmond and Danville	190¼	19
67	Mich .	24001	24001	Toledo, Detroit	Lake Shore and Michigan Southern.	65. 27	25
68	Tex ..	8683	31006	Longview, Houston	International and Great Northern	236	21
69	S. C ...	5601	13007	Charlotte, Augusta	Charlotte, Columbia and Augusta	195	18
70	Wis ..	25001	25001	Milwaukee, North McGregor	Chicago, Milwaukee and Saint Paul.	197. 20	17
71	Ind ...	12024	22024	Indianapolis, Terre Haute	Indianapolis and Saint Louis	72	26
72	Del ...	3401	.....	Wilmington, Delmar	Philadelphia, Wilmington and Baltimore.	97. 02	22
73	Iowa .	27021	27021	Dubuque, Sioux City	Illinois Central	327. 12	30
74	Mich .	24006	24006	Detroit, Grand Haven	Detroit and Milwaukee	189. 67	25
75	Ohio ..	9029	.....	Portsmouth, Reed's Mills	Marietta and Cincinnati	56	20
76	Tex ..	8503	.....	Houston, Denison City	Houston and Texas Central	337. 55	25
77	Ohio ..	9011	.....	Newark, Sandusky	Baltimore and Ohio	116	25
78	Mo ..	10503	28003	Pacific, Vinita	Atlantic and Pacific, (lessees South Pacific.)	327¼	22
79	Ind ...	12018	22018	Jeffersonville, North Vernon	Ohio and Mississippi	53. 5	27
80	Mo ...	28002	28002	Saint Louis, Columbus	Saint Louis, Iron Mountain and Southern, (late Saint Louis and Iron Mountain and Cairo and Fulton.)	197	21
81	Mass .	654	634	South Braintree Junction, Newport.	Old Colony, (late Old Colony and Newport.)	61. 75	30
82	Mass	641	.....	Taunton, Mansfield	New Bedford	12	22
83	Ill	23030	23030	East Saint Louis, Du Quoin	Saint Louis, Alton and Terre Haute.	71. 30	23

conveyed, the accommodations for mails and agents, &c.—Continued.

...le weight carried any distance thirty days.		Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Feet and inches.*				
...173 37,864	82,037	59,746	1,991	r. p. o., 44 11 by 9.6, f. f. c. and m. c., s. l., and r. a. in b. c. 3 miles.	12½*	$155 00	.....	51
...712 29,217	70,929	57,561	1,918	16.4 by 6 9, fixtures, s. l ...	19	152 00	In April, 1875.....	52
...839 54,674	214,513	165,353	2,755	16.8½ by 7.10¼, f. f., d. l.....	13	150 00	60 days, in March and April, 1875; speed at night, 15 miles per hour; main route; branch $35.76, (372.)	53
...761 108,035	145,796	138,691	2,311	18.1¾ by 8.9, f. f., s. l.....	13	150 0	60 days, in March and April, 1875; speed, 21 miles in day time. Part; residue $100, (88.)	54
...219 18,235	43,454	38,945	1,298	14.7 by 6.5, f. f., s. l.....	7	150 00	$400 side supply.....	55
...923 49,666	110,689	59,403	1,980	r. p. o., 40 by 10, f. f. c., s. l..	14*	143 00	Main route; branch $60, (176.)	56
...235 155,134	264,371	73,534	2,451	r. p. o., 27.6 by 9, f. f. c., s. l	12	140 00	.....	57
...751 27,648	74,399	45,160	1,505	r. p. o., 28 by 10, f. f. c. and m. c., s. l.; r. a. apt., 18 6 by 10, f. f. c., s. l., to Louisiana, 39 miles.	12	140 00	.....	58
...931 30,070	83,001	42,023	1,400	21 by 9.6, f. f., s. l.....	6	140 00	.....	59
...155 61,535	83,690	79,001	2,633	14.1 by 7.9, f. f., s. l.....	6	130 00	.....	60
...562 42,269	98,831	67,769	2,258	No apt.; no r. a	27¼*	130 00	In May, 1875	61
...400 16,522	63,922	50,041	1,668	10 by 7, s. l.....	7	130 00	Branch, part; residue $80; weight in December, 1874.	62
...259 49,466	103,325	37,876	1,262	r. p. o., 28 by 10, f. f. c. and m. c., s. l., 111.4 miles; r. a. apt., 18.6 by 10, f. f. c., s. l., 40.6 miles.	9¼*	130 00	40.6 miles at $110.....	63
...728 32,328	99,056	85,812	2,860	18 by 9, f. f., s. l	14	126 00	Part; residue $75; in April, 1875.	64
...556 96,970	147,626	114,786	3,826	r. p. o., 42 by 8.7, f. f., s. l ..	14	125 00	In October, 1874.....	65
...551 40,584	121,235	96,581	3,219	18 by 9, f. f., s. l	15⅞*	125 00	In April, 1875	66
...925 32,874	82,89	69,919	2,330	15 6 by 8.9¼, f. f., s. l., 25 miles; b. c., residue.	50¼*	125 00	.....	67
...166 24,038	71,204	54,735	1,824	14 by 8.7, f. f. and m. c., s. l	6	125 00	Main route; branches $50, (281, 301.)	68
...711 22,778	75,489	48,199	1,606	21 by 9, f. f., s. l.....	9½*	125 00	In April, 1875; transferred to N. C. section, No. 13007.	69
...851 28,235	90,086	47,704	1,590	23 by 10, s. l	6, 12	125 00	Trips, 6 in March, 12 in June, 1875.	70
...878 31,743	109,621	99,564	3,318	r. p. o., 39.4 by 9, f. f., s. l ..	18	115 00	In October, 1873	71
...294 135,004	320,298	175,836	1,953	24 by 9, 19 by 8, f. f., d. l., 84 miles; s. l. residue, 13.02 miles.	11¼*	115 00	0.1 mile increase. 90 days, from November 2, 1874.	72
...997 51,599	149,596	46,041	1,534	16 by 9, (average.) f. f., s. l	9½*	107 00	.....	73
...978 35,110	101,088	41,339	1,377	25.4 by 9.6, f. f., s. l.....	15*	105 00	.....	74
...42 55,661	91,089	75,218	2,506	17 by 8.7¼, f. f., s. l	12	100 00	In August, 1874	75
...563 81,410	133,073	65,443	2,181	21 by 7.3, f. f. c., s. l.....	10¾	100 00	In October, 1874. 2.8 miles decrease.	76
...522 56,746	124,268	64,731	2,157	16.6 by 6.6, f. f., s. l.....	18	100 00	In August, 1874.....	77
...330 32,511	113,841	64,282	2,142	21 by 9.6, f. f., s. l.....	6	100 00	In October, 1874.....	78
...010 46,705	67,715	61,848	2,061	r. p. o., 41 by 11, f. f., s. l., from Sept. 16, 1874; r. a apt., 20.6 by 11, f. f., s. l., from Jan. 15, 1874.	18	100 00	In July, 1874.....	79
...313 29,200	135,513	56,925	1,897	19.6 by 9.3, s. l	13	100 00	Main route; branches $50, (319,) $80, (113,) $130, (62,) and $30, (376;) in March, 1875.	80
...039 60,075	146,114	54,529	1,817	12.6 by 9, f. f. and m. c., d. l., to Middleborough, 22.82 miles; no r. a. residue, 38 93 miles.	12	100 00	Corrected returns. $930 m. m.	81
...575 24,818	48,493	47,532	1,584	11.10 by 7, f. f., s. l.....	27*	100 00	In October, 1874. $600 m. m.	82
...755 15,239	50,994	41,859	1,395	24 by 8, f. f., s. l.....	14¼*	100 00	.....	83

E.—*Table showing the weight of the mails, the speed with which they*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Miles per hour.
						Miles.	
84	Tex ..	8505	31004	Hempstead, Austin.....	Houston and Texas Central	118. 7	20
85	Ark ..	7501	29001	Memphis, Argenta	Memphis and Little Rock.....	134	15
86	Md ...	3505	.....	Araby, Frederick	Baltimore and Ohio	3	20
87	Oreg..	44001	.....	Portland, Roseburg.....	Oregon and California	198. 8	18
88	S. C...	5604	14002	Columbia, Florence	Wilmington, Columbia and Augusta.	82. 0	25
89	Kans .	14005	33005	Kansas City, Baxter Springs	Missouri River, Fort Scott and Gulf.	160. 2	20
90	Kans .	14211	33008	Kansas City, Ottawa.....	Leavenworth, Lawrence and Galveston.	33. 3	20
91	Tex ..	8504	31002	Harrisburgh, Luling.....	Galveston, Harrisburgh and San Antonio.	155. 2	14
92	Ohio ..	9013	.....	Sandusky, Springfield.....	Cincinnati, Sandusky and Cleveland.	131. 35	....
93	Kans .	14003	33003	Lawrence, Coffeyville.....	Leavenworth, Lawrence and Galveston.	142. 9	20
94	Pa	2430	.....	Harrisburgh, Martinsburgh.	Cumberland Valley	94	24
95	Wis ..	25005	25005	Watertown, Madison	Chicago, Milwaukee and Saint Paul.	38. 45	15
96	Mich .	24015	24015	Monroe, Ludington	Flint and Pere Marquette.....	254. 29	21
97	Conn .	908	.....	Bridgeport, Winsted.....	Naugatuck	62	20
98	Mass .	642	.....	Taunton, New Bedford	New Bedford	20¼	22
99	Ill	23016	23016	Bureau Junction, Peoria....	Chicago, Rock Island and Pacific	47	22
100	Minn .	26009	26009	Minneapolis, North McGregor.	Chicago, Milwaukee and Saint Paul.	215. 70	20
101	Wis ..	25003	25003	Milwaukee, Berlin.....	.....do	94. 80	20
102	N. J ..	2103	.....	Frankford Junction, Kensington.	Pennsylvania	2. 95	15
103	Ill	23025	23025	Hannibal, Naples.....	Toledo, Wabash and Western....	45. 50	20
104	Mich .	12956	24035	Toledo, Detroit	Toledo, Canada Southern and Detroit.	56. 37	25
105	Mich .	24021	24021	New Buffalo, Pentwater	Chicago and Michigan Lake Shore	170. 56	25
106	Iowa .	27029	27029	Missouri Valley, Sioux City.	Sioux City and Pacific.....	76	25
107	Mich .	24031	24031	Port Howard, Ishpeming ...	Chicago and Northwestern	181. 20	20
108	Ky ...	9738	20011	Louisville, Paducah, Elizabethtown.	Louisville, Paducah and Southwestern, (late Elizabethtown and Paducah.)	232. 19	25
109	Iowa ..	27019	27019	Keokuk, Des Moines.....	Keokuk and Des Moines	162	20
110	Mich..	24007	24007	Detroit, Port Hudson.....	Grand Trunk	64. 50	25
111	Wis ..	25016	25016	Milwaukee, Green Bay.....	Wisconsin Central, (operated by Phillips & Colby Construction Company.)	111. 54	22
112	Wis...	25016	25016	Hilbert, Menasha.....	.....do	16	22
113	Mo....	28002	28026	Bismarck, Texarkana.....	Saint Louis, Iron Mountain and Southern, (late Saint Louis and Iron Mountain and Cairo and Fulton.)	406. 41	20½
114	Ill	23041	23041	Quincy, Hannibal.	Quincy, Alton and Saint Louis...	19. 4	20
115	Ill	23041	23041	Quincy, Louisiana	.....do	43	20

conveyed, the accommodations for mails and agents, &c.—Continued.

ole weight carrd any distance r thirty days.		Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Feet and inches.*				
13,427	44,742	34,996	1,166	21 by 7.3, f. f. c., s. l.	6	$100 00	In October, 1874	84
12,746	42,430	34,902	1,163	10.4 by 8.2, 9.4 by 6.4, f. f., s. l.	7	100 00	In April, 1875	85
18,712	33,224	33,224	1,107	17 by 8.7½, f. f.; no r. a	12	100 00	In October, 1874	86
30,595	50,401	31,142	1,038	9.9 by 6.6½, f. f, s. l	6	100 00	In November, 1874	87
51,512	72,234	62,218	1,036	18.1¾ by 8.9, f. f., s. l	7	100 00	60 days, in March and April, 1875; speed, 21 miles in day-time. Part; residue $150, (54.)	88
29,554	66,532	27,907	930	23 by 8.6, f. f. c., s. l.	13⅔*	100 00	In October, 1874. 3.8 miles decrease.	89
10,897	23,881	20,948	698	23 by 8.6, f. f., s. l.	6	100 00	In October, 1874; pay from Olathe. 1.3 miles increase.	90
8,152	29,282	20,916	697	12 by 7, f. f., s. l.	12	100 00	Pay not fixed on 71.2 miles.	91
23,350	43,354	18,077	602	.....	....	100 00	Incomplete; new weighing to be had.	92
12,202	31,995	17,700	589	23 by 8.6, f. f., s. l.	6	100 00	In October, 1874. 2.6 miles increase. Main route; branch $50, (221.)	93
25,204	60,307	16,376	545	9.1 by 8.4, f. f., s. l.	11¼*	100 00	22 miles at $50, and pay to be fixed on 20 miles from December 1, 1873; weight in September, 1874.	94
3,854	8,245	4,992	166	12 by 6.10, f. f., s. l.	6	100 00	.....	95
33,766	104,541	27,749	924	21 by 8.10½, f. f., s. l.	14¼*	96 00	Main route; branches $60, (184,) $40, (336,) $40, (368.)	96
25,297	63,584	35,213	1,173	16 by 6, f. f., d. l.	14*	95 00	In February, 1875 Main route; branch $50, (278.)	97
23,542	53,764	50,176	1,672	11.10 by 7, f. f., s. l.	35	90 00	In October, 1874. $612.50 m. m.	98
12,711	35,143	31,652	1,055	24 by 10, f. f. c., s. l	12	90 00	.....	99
43,259	83,975	31,155	1,038	27 by 10.3, s. l.	6	90 00	.....	100
10,450	36,603	18,537	617	23 by 10, f. f., s. l	12	90 00	.....	101
46,513	69,289	69,289	770	15.6 by 6.5½, f. f., s. l	24	88 00	90 days, from November 2, 1874. Branch main route $567, (2.)	102
45,623	58,036	49,157	1,638	12 by 9, f. f., s. l	12	87 50	Main route; branch $50, (280.)	103
14,862	26,333	21,683	722	16 by 9.2, f. f., s. l.	12	86 00	In August, 1874	104
20,877	55,847	19,719	657	12 by 9, f. f., s. l.	14½*	86 00	Main route; branch $50, (211.)	105
11,225	38,726	33,685	1,122	20 by 9, f. f., s. l.	12	85 00	Main route; branch $50, (254.)	106
12,310	38,138	27,312	910	19.2 by 7, 16 by 7.3, 12 by 6.6, f. f., s. l.	7	85 00	.....	107
21,185	47,099	11,294	376	12 by 9.6, 9 by 7.6, f. f., s. l	6	85 00	In May, 1874	108
22,312	45,317	15,699	523	13 by 9, s. l	12	84 00	.....	109
7,996	31,886	24,406	813	22.5 by 7.7, f. f., s. l.	15*	83 00	.....	110
11,618	30,112	13,497	449	13.7 by 7.7, f. f., s. l.	6	83 00	Main route; branch $83, (112.)	111
3,992	10,916	10,369	345	13.7 by 7.7, f. f., s. l.	6	83 00	Branch; main route $83, (111.)	112
33,415	137,485	85,533	2,851	24.8 by 8.11, s. l.	7	80 00	Branch; main route $100, (80). 144.41 mls. at $130. In March, 1875.	113
.....	.....	45,954	1,531	r. p. o., (say) 51.2 by 9.10, f. f., s. l.; r. a. apt., 15.6 by 8.10, f. f., s. l.	19	80 00	r. p. o. size "over all," 57.6. Part; residue $80, (117.)	114
25,159	54,586	33,669	1,122	r. p. o., (say) 51.2 by 9.10, f. f., s. l., 19.40m.; r. a. apt., 15.6 by 8.10, f. f., s. l.	11¾	80 00	r. p. o. size "over all," 57.6.	115

E.—*Table showing the weight of the mails, the speed with which they*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Miles per hour.
						Miles.	
116	Tex...	8506	.....	Shreveport, Dallas	Texas and Pacific	189.2	24
117	Ill....	23041	23041	Fall Creek, Louisiana	Quincy, Alton and Saint Louis	30.85	20
118	Tex...	8506	31009	Shreveport, Dallas	Texas and Pacific	189.2	18½
119	Iowa..	27011	27011	Viele Junction, Burlington	Chicago, Burlington and Quincy	25.75	21
120	Minn..	26015	26015	Winona, Saint Peter	Chicago and Northwestern	144.26	20
121	Iowa..	27011	27011	Keokuk, Burlington	Chicago, Burlington and Quincy	42.75	21
122	Iowa..	27011	27011	Keokuk, Viele Junction	do	17	21
123	Iowa..	27011	27011	Keokuk, Burlington	do	42.75	21
124	Ill....	23005	23005	Sterling, Alton Junction	Rockford, Rock Island and Saint Louis.	270.80	20
125	Minn..	26004	26005	Saint Paul, Saint James	Saint Paul and Sioux City	122	20
126	Minn..	26004	26018	Saint James, Le Mars	Sioux City and Saint Paul	123	20
127	Wis..	25010	25010	Caledonia Station, Elroy	Chicago and Northwestern	135.45	20
128	Wis..	25010	25010	Caledonia Station, Winona Junction.	do	190.35	20
129	Kans..	14002	33002	Atchison, Waterville	Central Branch Union Pacific	100	20
130	Fla...	6402	.....	Jacksonville, Chattahoochee.	Jacksonville, Pensacola and Mobile.	215¾	15
131	Iowa..	27001	27001	Burlington, Plymouth	Burlington, Cedar Rapids and Minnesota.	228	25
132	Mich..	24004	24004	White Pigeon, Grand Rapids.	Lake Shore and Michigan Southern.	95.67	25
133	Mich..	24010	24010	Jackson, Grand Rapids	Michigan Central	94.86	23
134	Minn..	26006	26007	Saint Paul, Du Luth	Lake Superior and Mississippi	155.73	22
135	Mo...	28007	28007	Moberly, Ottumwa	Saint Louis, Kansas City and Northern.	131	22
136	Mich..	24002	24002	Monroe, Adrian	Lake Shore and Michigan Southern.	35.23	25
137	Mass.	746	.....	Taunton, Attleborough	New Bedford, (operating Boston, Clinton and Fitchburgh.)	16.67	28
138	Wis...	25011	25011	Kenosha, Rockford	Chicago and Northwestern	73.60	15
139	Mo....	28018	28018	Keokuk, Hannibal	Mississippi Valley and Western	60.72	20
140	Mo Kans.	28016 33011	....	Pleasant Hill, Carbondale	Saint Louis, Lawrence and Western.	94	18
141	Ill....	23033	23033	Beardstown, Shawneetown	Springfield and Illinois Southeastern.	229.70	16
142	N. J...	2126	.....	New York, Pemberton Junction.	New Jersey Southern	84.6	25
143	Md....	3508	.....	Annapolis, Annapolis Junction.	Annapolis and Elk Ridge	20½	20
144	Ill....	23011	23011	Burlington, Quincy	Chicago, Burlington and Quincy	71.85	22
145	Dak...	13029	.....	Sioux City, Yankton	Dakota Southern	61.48	18
146	Ill....	23038	23038	Peoria, Jacksonville	Peoria, Pekin and Jacksonville	87.40	19
147	Mo....	28016	28016	Pleasant Hill, Carbondale	Saint Louis, Lawrence and Western.	94	12
148	Ala...	6609	17009	Selma, York Station	Alabama Central	81.70	16
149	Iowa..	27031	27031	Des Moines, Fort Dodge	Des Moines and Fort Dodge	88.32	20
150	La...	8005	30008	Vicksburgh, Monroe	North Louisiana and Texas	75.5	15
151	Mo....	28005	28005	Palmyra, Hannibal	Hannibal and Saint Joseph	15	20
152	Ga...	6017	15001	Atlanta, Charlotte	Atlanta and Richmond Air-Line	266.5	20½
153	Wis...	25013	25024	Racine, Rock Island	Western Union	189.40	22
154	Ill....	23037	23037	Vincennes, Cairo	Cairo and Vincennes	158	25
155	Wis...	25010	25010	Elroy, Winona Junction	Chicago and Northwestern	54.90	20
156	Wis...	25017	25017	Menasha, Colby	Wisconsin Central, (operated by Phillips & Colby Construction Company.)	114.20	18
157	Wis...	25017	25017	Menasha, Worcester	do	164.10	18

conveyed, the accommodations for mails and agents, &c.—Continued.

ole weight carried any distance r thirty days.		Average weight carried whole distance.			Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
	Inward.	Total.	30 days, total.	Per day, total.					
e.	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Feet and inches.*				
624	31, 599	76, 223	31, 506	1, 05	14.1 by 7.10, s. l.	7	$80 00	In November, 1874. Weighing voluntary.	116
..	.....	.....	26, 537	884	15.6 by 2.10, f f., s. l.	6	80 00	Part; residue $80, (114.)	117
132	32, 689	93, 821	25, 973	865	14.1 by 7.9, f. f.	7¼*	80 00	In March, 1875	118
...	.....	.....	22, 145	738	15.3 by 8.9, f. f., s. l.; lap 12 6 by 7.7, fixtures, s. l.	18	80 00	Part; lap 6 trips, (122)	119
052	13, 794	36, 846	22, 041	734	13.5 by 9.6, f. f., s. l.	6	80 00	Main route; branch $60, (187.) 2.91 miles increase.	120
700	19, 501	29, 201	20, 195	673	15.3 by 8.9, f. f., s. l.	12	80 00	.....	121
..	.....	.....	17, 213	574	15.3 by 8.9, f. f., s. l.	12	80 00	Part; residue lap, (119)	122
883	14, 483	22, 366	17, 149	571	15.3 by 8.9, f. f., s. l.	12	80 00	Without lap	123
300	27, 610	52, 910	11, 117	370	11.6 by 9.4, f. f., s. l.	8*	80 00	.....	124
367	38, 196	110, 563	67, 726	1, 128	22 by 9.3, f. f., s. l.	12	77 25	60 days. Part of 26004; residue $77.25, (126.)	125
035	27, 225	61, 260	41, 861	697	22 by 9.3, f. f., s. l.	6	77 25	60 days. Part of 26004; residue $77.25, (125.)	126
..	.....	.....	49, 280	1, 642	34 by 9.7, f. f., s. l.	12	75 00	Part; residue $70, (155)	127
251	26, 309	87, 560	38, 756	1, 291	34 by 9.7, 12 by 9.6, f. f., s. l	10¼*	75 00	.....	128
291	18, 648	38, 939	29, 930	997	18 by 8.9, f. f, s. l	7	75 00	In May, 1874	129
487	33, 794	63, 281	25, 882	862	16 by 9, 12 by 7, f. f., s. l.	7	75 00	Main route; branch $30. In March, 1874.	130
159	29, 276	63, 435	24, 788	826	12 by 9.6, f. f., s. l.	6	75 00	.....	131
151	18, 030	47, 181	24, 625	820	16.5 by 9, f. f., s. l.	9*	75 00	58.90 miles at $70	132
651	14, 205	35, 856	24, 115	803	10.7½ by 8.6, f. f., s. l.	12	75 00	.....	133
642	20, 470	69, 112	46, 938	782	22 by 9, f. f., s. l	12	75 00	60 days, in March and June, 1875; 0.27 mile decrease.	134
585	12, 757	42, 342	19, 440	648	22 by 7 6, f. f., s. l	6	75 00	.....	135
082	11, 698	21, 780	19, 036	634	15.6 by 8.9¾, f. f., s. l.	12	75 00	.....	136
480	10, 448	16, 928	16, 786	559	No apt	28	75 00	In October, 1874	137
302	18, 474	69, 776	16, 607	553	9 by 9, f. f., s. l	6	75 00	.....	138
118	15, 788	29, 906	15, 812	527	12 by 7, f. f., s. l.	6	75 00	In March, 1875	139
446	25, 712	62, 158	30, 763	512	15.6 by 7.7, f. f., s. l	6	75 00	60 days, in May and June, 1874.	140
127	19, 818	43, 945	13, 839	461	14 by 11, s. l.	6	75 00	.....	141
526	15, 203	30, 729	12, 335	411	8 by 6, f. f., s. l.	10½*	75 00	In October, 1874. Main route; branches $50, (299. 314;) 19.5 miles steamboat.	142
767	7, 637	13, 404	11, 290	376	8 by 8, fixtures, d. l	12	75 00	In October, 1874	143
655	8, 877	18, 532	10, 905	363	10.3 by 6.11, f. f., s. l.	6	75 00	.....	144
951	5, 484	16, 435	10, 714	357	24 by 9.6, f. f., s. l.	6	75 00	In August, 1874	145
504	9, 880	20, 384	9, 686	322	13.4 by 8, f. f	6½*	75 00	.....	146
392	6, 268	18, 660	8, 942	298	14 by 7, 10 by 8, f. f., s. l	6	75 00	In March, 1875	147
348	6, 762	17, 110	8, 201	273	12 by 7, f. f.	7	75 00	In October, 1874	148
595	6, 465	15, 060	7, 235	241	1,128 cubic feet, f. f., s. l.	6	75 00	Pay to June 30, 1874, under old No. 11001; to be fixed from July 1, 1874, on these returns.	149
111	2, 928	10, 039	6, 808	227	8.9 by 8.9, f. f., s. l.	7	75 00	$500 m. m. and ferriage.	150
837	3, 492	5, 329	5, 329	177	b. c.; no r. a.	13	75 00	Branch; main route $237.50, (14.)	151
898	23, 817	49, 715	33, 478	1, 115	20 by 9, fixtures, s. l.	7	70 00	In April, 1875	152
439	34, 577	64, 916	18, 865	629	17 by 9, f. f., s. l	12	70 00	.....	153
826	15, 059	32, 885	17, 143	571	15 by 6.6, f. f., s. l.	6	70 00	.....	154
..	.....	.....	14, 934	497	12 by 9.6, f. f., s. l.	6	70 00	Part; residue $75, (127)	155
..	.....	.....	6, 212	206	13.7 by 7.7, f. f., s. l.	6	70 00	Part; residue $40, (157 rem.;) 48.93 miles at $40.	156
446	6, 695	18, 141	4, 717	157	13.7 by 7.7, f. f., s. l	6	70 00	48.93 miles at $40, and pay not fixed on 49.90 miles.	157

E.—*Table showing the weight of the mails, the speed with which they*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Miles per hour.
						Miles.	
158	Mich..	24013	24013	Detroit, Bay City	Detroit and Bay City	108.97	25
159	Minn..	26002	26003	Saint Paul, Sauk Rapids	Saint Paul and Pacific	78	18
160	Wis...	25024	25013	Milwaukee, Fond du Lac	Chicago and Northwestern	63.53	22
161	Wis...	25018	25018	Milwaukee, Two Rivers	Milwaukee, Lake Shore and Western.	85	20
162	Mich..	24017	24017	Detroit, Howard City	Detroit, Lansing and Lake Michigan.	164.67	25
163	Tex...	8577*a*	.....	Bremond, Waco	Houston and Texas Central, (operating Waco and Northwestern.)	44.56	20
164	Tex...	8770	.....	Sherman, Brookston	Texas and Pacific	57	15
165	Minn..	26014	26014	Saint Peter, New Ulm	Chicago and Northwestern	30	20
166	Tex...	8770	31011	Sherman, Brookston	Texas and Pacific	57	11
167	Ill....	23027	23027	State Line, Warsaw	Toledo, Peoria and Warsaw	228.75	20
168	Dak...	35001	.....	Sioux City, Yankton	Dakota Southern	61.48	20
169	Iowa..	27022	27022	Waterloo, Mona	Illinois Central	80	12
170	Minn..	26005	26001	Du Luth, Fargo	Northern Pacific	229	22
171	Utah..	41002	.....	Salt Lake City, Provo City	Utah Southern	49	....
172	N. Y..	1293	.....	Ithaca, Geneva	Geneva, Ithaca and Athens	40¼	25
173	Me...	202	12	Portland, Bartlett	Portland and Ogdensburgh	72.85	22
174	N. J..	2105	.....	Camden, Monmouth Junction	Pennsylvania	53.56	22
175	Iowa..	27017	27017	Wilton Junction, Leavenworth City.	Chicago, Rock Island and Pacific	322.77	24
176	Mo...	28006	28028	Saint Joseph, Hopkins	Kansas City, Saint Joseph and Council Bluffs.	61½	24
177	Minn	26016	26016	La Crosse, Winnebago City	Southern Minnesota	170.50	18
178	Ill....	23008	23008	Elmwood, Buda	Chicago, Burlington and Quincy	45	20
179	Iowa..	27012	27012	Clinton, La Crescent Junction.	Chicago, Dubuque and Minnesota.	179.77	20
180	Iowa..	27005	27005	Red Oak, Eastport	Burlington and Missouri River	50	17
181	Iowa..	27007	27007	Creston, Hopkins	do	44.4	22
182	Ill....	23040	23040	Peoria, Rock Island	Peoria and Rock Island	92	20
183	Ill....	23012	23012	Streator, Aurora, Batavia	Chicago, Burlington and Quincy	69.79	22
184	Mich	24015	24015	East Saginaw, Bay City	Flint and Pere Marquette	12.75	25
185	Mo...	28019	28019	Quincy, Kirksville	Quincy, Missouri and Pacific	71.28	20
186	Ill....	23008	23008	Rushville, Yates City	Chicago, Burlington and Quincy	63.75	19
187	Minn	26015	26015	Mankato Junction, Mankato	Chicago and Northwestern	4.25	20
188	Pa....	2491	.....	Pollock, Karns City	Parker and Karns City	10	10
189	N. J..	2105	.....	Jamesburgh, South Amboy	Pennsylvania	14.95	26.3
190	Nebr.	34005	.....	Brownville, Seward	Midland Pacific	105.85	15
191	Mich..	24038	24038	Walton, Petoskey	Grand Rapids and Indiana	71.86	20
192	Mo...	28008	28008	Tipton, Boonville	Atlantic and Pacific	25	20
193	N. J..	2103	.....	Princeton Junction, Princeton.	Pennsylvania	3	12
194	Mich..	24034	24034	Walton, Traverse City	Continental Improvement Co	26.26	20
195	Iowa..	27026	27026	Conover, Decorah	Chicago, Milwaukee & Saint Paul.	9.5	12
196	Ill....	23042	23042	Chicago, Danville	Chicago, Danville and Vincennes.	108	22
197	Mo...	28009	28009	Centralia, Columbia	Saint Louis, Kansas City and Northern.	22	22

yed, the accommodations for mails and agents, &c.—Continued.

Weight carried distance sixty days.		Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Feet and inches.*				
0, 558	32, 122	21, 103	703	14 by 7.6, f. f., s. l.	12	$68 00		158
6, 256	21, 042	14, 533	484	12.8 by 9, f. f., s. l.	9½*	68 00		159
7, 553	18, 456	13, 395	446	12.2½ by 7.4½, f. f., s. l.	6	68 00		160
7, 132	21, 863	15, 045	501	14 by 7.10, f. f., s. l.	12	67 00	Main route; branch $40, (352.)	161
2, 934	39, 136	16, 835	561	10.6 by 9, fixtures, s. l.	11¼*	65 00		162
6, 111	17, 686	16, 474	548	14 by 7, f. f., s. l.	6	65 00	In January, 1875	163
6, 584	15, 667	13, 141	438	14.1 by 7.10, s. l.	6	65 00	In November, 1874	164
4, 484	12, 371	11, 694	389	13.5 by 9.6, f. f., s. l.	6	65 00	Part; residue $30, (379)	165
2, 849	9, 565	6, 456	215	14.1 by 7.9, f. f., s. l.	6	65 00	In March, 1875	166
5, 841	60, 812	13, 730	457	23 by 8.9, f. f., s. l.	6	64 00	Main route; branch $50, (276;) $600 for ferriage.	167
7, 598	26, 838	19, 520	643	21.6 by 9, (193½ square ft.,) f. f., s. l.	6	63 00	In March, 1875	168
0, 382	27, 863	14, 616	487	19.1 by 8.11, 17.10 by 9, f. f., s. l.	12	63 00		169
7, 021	21, 669	13, 526	450	20 by 8.6, 20 by 8.8, 13 by 7.4, f. f. c., s. l.	6	63 00	Part; residue $40, (344.) 23 miles bp.	170
5, 271	13, 713	10, 851	361			63 00	In July, 1875. Incomplete.	171
8, 475	16, 914	10, 642	355	12 by 7, f. f., s. l.	6	63 00	In July, 1874	172
0, 263	64, 905	54, 033	1, 801	10 by 6.7½, f. f., d. l.	12	60 00	In June, 1874	173
2, 392	166, 504	75, 510	839	8 by 6 6, d. l., to Bordentown, 27 m., s. l. residue, 26.56 m.	10½*	60 00	90 days; from Oct. 1, 1874. Main route; branches $60, (189,) $50, (204.)	174
0, 245	84, 381	21, 507	716	22 by 10, f. f., s. l.	10*	60 00		175
1, 272	21, 308	14, 299	476	13.4 by 7.5, f. f. c., s. l.	6	60 00	Branch of 28006; main route $143, (56.)	176
1, 842	33, 859	13, 557	451	21 by 9.2, f. f., s. l.	6	60 00	Speed, 11½ miles per hour beyond Wells, 23 miles.	177
2, 683	17, 847	13, 119	437	6.2 by 6.9, f. f., s. l.	6	60 00	Branch; main route $60, (186.)	178
5, 462	87, 854	25, 863	431	18.6 by 8.10, f. f., s. l.	8*	60 00	60 days, in March and April, 1875.	179
4, 849	17, 896	12, 776	425	13.6 by 6.9, f. f., s. l.	9*	60 00	Branch; main route $200, (27.)	180
3, 930	14, 767	12, 079	402	15.3 by 7.3, f. f., s. l.	6	60 00		181
1, 450	24, 769	11, 146	371	12 by 7, f. f., s. l.	6	60 00		182
2, 471	20, 544	9, 680	322	22.5 by 9.6, f. f. c. and m. c., s. l.	11¼*	60 00	Main route and branch.	183
3, 951	10, 427	9, 683	322	b. c.; no r. a	27*	60 00	Branch; main route $96, (96.)	184
5, 984	14, 581	9, 084	303	11.4 by 7, f. f., s. l.	12	60 00		185
2, 947	20, 109	8, 772	292	24.8 by 8.10, f. f. c. and m. c., s. l., and r. a. in b. c. from Lewistown, 30 miles.	8¾*	60 00	Main route; branch $60, (178.)	186
2, 735	6, 259	6, 259	208	13.5 by 9.6, f. f., d. l.	12	60 00	Branch; main route $80, (120.)	187
4, 730	11, 141	6, 173	205	8 by 5, f. f., d. l.; r. a. not appointed by Department.	12	60 00	In December, 1874	188
5, 346	7, 482	5, 566	61	b. c.; no r. a	6	60 00	Branch; main route $60, (174.) 90 days, from Oct. 1, 1874.	189
7, 186	19, 689	8, 596	286	12 by 7, f. f., s. l.	9¼*	57 00	In May, 1875	190
4, 239	10, 656	8, 593	286	10.6 by 6.11, s. l.	7	57 00		191
3, 123	7, 898	6, 445	214	14 by 9.3, f. f.; no r. a	12	56 00	In April, 1875	192
0, 220	23, 859	23, 859	265	No apt.; no r. a	12	55 00	90 days, from Nov. 2, 1874. Branch; main route $567, (2.)	193
2, 137	7, 203	6, 270	209	10.6 by 6.11; no r. a	6	55 00		194
2, 950	6, 084	6, 084	202	No r. a	12	55 00		195
1, 307	27, 504	15, 544	518	14 by 6.8, f. f., s. l.	12	54 00	Main route; branch $40, (370.)	196
2, 625	5, 178	4, 199	139	No apt.; no r. a.	6	54 00		197

E.—*Table showing the weight of the mails, the speed with which they*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Miles per hour.
						Miles.	
198	Tenn	10003	19003	Rogersville, Bull's Gap	Rogersville and Jefferson R. R., (W. P. Elliott, owner.)	15	15
199	Utah	41002	.....	Provo City, York	Utah Southern	27	....
200	Iowa	27008	27008	Viele Junction, Unionville	Burlington and Southwestern	104.75	18
201	Minn	26011	26011	Winona, La Crescent	Chicago, Milwaukee and Saint Paul.	25	17
202	Tex	8749	.....	Marshall, Texarkana	Texas and Pacific	74	24
203	Tex	8683 8666	8683	Houston, Longview	International and Great Northern	236	24
204	N. J	2105	.....	Bordentown, Trenton	Pennsylvania	7	22.8
205	W. Va.	4101	12001	Harper's Ferry, Staunton	Baltimore and Ohio	192.72	25
206	Ohio	9019	.....	Blanchester, Hillsborough	Marietta and Cincinnati	21	20
207	Mich	24018a	24018	Fort Wayne, Walton	Grand Rapids and Indiana	260.55	20
208	Mo	10517a	.....	Pleasant Hill, Lawrence	Saint Louis, Lawrence & Western	62	18
209	Mass	738	657	Winchendon, Peterborough	Boston, Barre and Gardner, (late Monadnock.)	16.37	24
210	Iowa	27010	27010	Albia, Northwood	Central, of Iowa	139.2	20
211	Mich	24021	24021	Holland, Grand Rapids	Chicago and Michigan Lake Shore	26.65	25
212	Pa	2486	.....	Pittsburgh, Monongahela City.	Pittsburgh, Virginia & Charleston	31.84	20
213	Mich	24003	24003	Adrian, Jackson	Lake Shore & Michigan Southern	47.25	25
214	N. J	2107	.....	Camden, Atlantic City	Camden and Atlantic	60	28
215	Mich	24009	24009	Jackson, Otsego Lake	Michigan Central	228.4	21½
216	Mich	24028	24028	Jonesville, Lansing	Lake Shore & Michigan Southern	60.87	22
217	Ill	23007	23007	Galva, Keithsburgh	Chicago, Burlington and Quincy	59.30	20
218	Wis	25004	25004	Milton Junction, Monroe	Chicago, Milwaukee & Saint Paul	42.80	15
219	Iowa	27025	27025	Calmar, Algona	do	127.8	15
220	Mass	658	741	Springfield, Athol Depot	Springfield, Athol and Northeastern, (late Athol and Enfield.)	49.98	20
221	Kans	14003	33003	Cherryvale, Independence	Leavenworth, Lawrence and Galveston.	10	20
222	Iowa	27015	27015	Des Moines, Indianola	Chicago, Rock Island and Pacific	21.4	17
223	Mo	10508	28008	Tipton, Boonville	Atlantic and Pacific, (lessees Pacific, of Missouri.)	25	20
224	Minn	26001	26002	Saint Paul, Breckinridge	Saint Paul and Pacific	219.25	18
225	N. C	5003	13003	Wilmington, Monroe	Carolina Central	164	20
226	Pa	2441	.....	Washington, Wheeling	Hempfield	32	20
227	Minn	26003	26004	East Saint Cloud Station, Melrose.	Saint Paul and Pacific	35	12
228	Ga	6145	15021	Camac, Macon	Macon and Augusta	79	20
229	Ill	23052	23052	Courtland Station, Sycamore	Sycamore and Courtland	5	25
230	Md	3506	.....	Weaverton, Hagerstown	Baltimore and Ohio	24½	25
231	Va	4404	11004	Alexandria, Round Hill	Washington and Ohio	52.74	23
232	Mich	24025	24025	Jackson, Niles	Michigan Central	104.57	26
233	Wis	25015	25015	Green Bay, Winona	Green Bay and Minnesota, (late Green Bay and Lake Pepin.)	216.41	20
234	Iowa	27020	27020	Farley, Cedar Rapids	Dubuque Southwestern	55.37	13
235	Iowa	27002	27002	Cedar Rapids, Postville	Burlington, Cedar Rapids and Minnesota.	99.80	16
236	Iowa	27027	27027	Davenport, Fayette	Davenport and Saint Paul	129.31	16

onveyed, the accommodations for mails and agents, &c.—Continued.

e weight carl any distance thirty days.		Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Feet and inches.*				
15 2,413	4,228	3,416	113	r a. in baggage apt.; s. l.; no distribution.	6	$52 66	In December, 1874	198
34 3,239	8,943	7,08.	235	.....	...	52 00	Extension. In July, 1875. Incomplete.	199
80 4,50	14,788	5,647	188	12.6 by 7.7, fixtures, s. l.	6	52 00	.....	200
17 66,305	81,922	80,37	2,679	No r. a	12	50 00	.....	201
72 37,854	56,426	52,89	1,763	14.1 by 7.10, s. l	7	50 00	In November, 1874	202
31 41,212	65,743	46,923	1,564	11 by 9, f. f. c., s. l	7	50 00	In December, 1874. Parts. Consolidated as 8683.	203
20 62,902	88,122	88,122	979	8 by 6. 6., s. l.	12	50 00	90 days, from Oct. 1, 1874. Branch; main route $60, (174.)	204
64 24,691	62,955	29,387	679	17 by 8.7½, f. f., s. l	6	50 00	In August, 1874. Weight for 113 miles.	205
12 9,898	21,610	18,860	628	17 by 9. 6, f. f.; in charge of baggage-master.	12	50 00	In August, 1874	206
10 25,493	70,803	17,004	566	10.6 by 6.11, s. l	9¼	50 00	.....	207
.....	.....	34,014	566	15.6 by 7.7, f. f., s. l	6	50 00	60 days, in May and June, 1874.	208
36 7,168	15,604	13,936	464	10 by —, fixtures, s. l	12	50 00	In November, 1874. 0.37 mile increase.	209
68 16,512	42,980	12,830	427	12 by 9.5, f. f., s. l	6	50 00	.....	210
61 7,072	15,033	12,809	426	12 by 9, f. f., s. l	12	50 00	Branch; main route $86, (105.)	211
54 4,954	15,608	12,206	406	10 by 8, fixtures, s. l	12	50 00	In July, 1875	212
93 6,214	20,607	12,070	402	11.9½ by 8.8, f. f., s. l	6	50 00	.....	213
04 7,301	19,605	10,097	336	8.6 by 6, fixtures, s. l	14	50 00	In May, 1875	214
46 22,194	51,840	9,731	324	13.10 by 6, f. f., s. l., to Saginaw, 101 miles; ½ line residue, 127.4 miles.	8¼	50 00	Speed 15 miles beyond Saginaw, 127.4 miles. Mails weighed to Gaylord, 8 miles beyond Otsego Lake.	215
94 7,573	15,967	9,430	314	22 by 9, f. f., s. l	6	50 00	.....	216
70 5,263	14,933	9,137	304	10.4 by 8.10, f. f., s. l	6	50 00	Branch; main route $273, (10.)	217
97 4,651	12,848	8,924	297	14 by 10.3, s. l.	6	50 00	.....	218
36 8,529	21,665	8,758	291	24 by 10, f. f., s. l	6	50 00	.....	219
35 6,094	14,129	8,743	291	12 by 6.6, f. f., s. l	6	50 00	.....	220
76 3,740	8,716	8,716	29	No r. a	6	50 00	Branch; main route $100, (93.) In October, 1874.	221
61 3,704	11,863	8,579	285	r. a. in b. c	6	50 00	Main route; branch $50, (252.)	222
40 4,422	10,762	8,435	281	14 by 9.3, f. f., no r. a	12	50 00	In October, 1874	223
24 10,693	28,117	8,276	275	21.3 by 9, f. f., s. l	8	50 00	.....	224
42 9,021	22,363	8,061	268	14.2 by 9, f. f., s. l	6	50 00	In October, 1874. Pay on 141 miles.	225
63 9,651	16,914	7,801	260	17 by 8.7½, f. f., s. l	12	50 00	In October, 1874	226
10 3,748	13,258	7,697	256	12.8 by 9, f. f., s. l	6¼	50 00	.....	227
78 6,183	12,861	7,641	255	12.4 by 6.8, furniture, s. l.	6	50 00	In October, 1874	228
31 3,804	7,537	7,537	251	13.9 by 9.9, in passenger-car; no r. a.	12¼	50 00	$150 m. in	229
54 4,347	10,697	7,312	244	17 by 8.7½, f. f., d. l. (See remark.)	12	50 00	In October, 1874. 2d line in apt. used jointly by baggage-master and r. a.	230
24 5,269	13,593	7,257	241	12 by 6, f. f., s. l	6	50 00	In May, 1875	231
79 8,679	17,758	7,059	235	11.9 by 7.2, 10.8 by 8.11, f. f., s. l.	6	50 00	.....	232
65 9,236	22,901	6,994	233	11.11 by 7.6½, f. f., s. l	6	50 00	.....	233
89 8,062	19,351	6,853	228	10 by 8.6, f. f., s. l	6	50 00	.....	234
13 7,609	16,122	6,644	221	10.6 by 7.8, f. f., s. l	6	50 00	.....	235
64 8,372	19,336	6,531	217	10.6 by 7, 10.3 by 7, f. f., s. l.	6	50 00	Pay to be fixed on 39.3 miles from Jan. 1, 1874.	236

E.—*Table showing the weight of the mails, the speed with which they*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Miles per hour.
						Miles.	
237	Mo ...	28012	28012	Saint Joseph, Lexington....	Saint Louis, Kansas City and Northern, (late Saint Louis and Saint Joseph.)	76 ¾	25
238	Ill	23053	23053	East Saint Louis, Murphysborough.	Cairo and Saint Louis.....	91	20
239	Ill	23026	23026	La Fayette, Bloomington ...	Toledo, Wabash and Western....	116. 43	25
240	Mass .	639	.....	New Bedford, West Wareham.	New Bedford	16¼	22½
241	Mich .	24023	24023	Allegan, Muskegon	Michigan Lake Shore	58. 37	20
242	Wis ..	25019	25019	Sheboygan, Princeton.....	Sheboygan and Fond du Lac	79. 05	21
243	N. Y..	1540	1235	Oswego, Middletown.....	New York and Oswego Midland..	249. 98	22½
244	Mo ...	28021	28021	Mexico, Cedar City	Chicago and Alton.....	50. 62	20
245	.....	.....	.....	(Vacant.)			
246	Mich .	24012	24012	Lenox, Romeo	Saint Clair and Chicago Air-Line	16. 13	24
247	Ill	23047	23047	Chester, Tamaroa.....	Iron Mountain, Chester and Eastern.	42	15
248	Ill	23055	23055	Decatur, Montezuma	Indiana and Illinois Central.....	87	21½
249	Mo ...	105180	28017	Sedalia, Lexington.....	Atlantic and Pacific, (lessees Pacific, of Missouri.)	56½	20
250	Pa....	2480	.....	Red Bank Furnace, Driftwood.	Allegheny Valley	109. 95	19
251	Mo ...	28024	28024	Holden, Paola.....	Missouri, Kansas and Texas	55	15
252	Iowa..	27015	27015	Somersett Junction, Wintersett.	Chicago, Rock Island and Pacific	27. 1	17
253	Tex...	8666	31007	Palestine, Rockdale.....	International and Great Northern	121	10
254	Iowa..	27029	27029	California Junction, Wisner	Sioux City and Pacific	83. 4	20
255	Mo ...	10513	28012	Saint Joseph, Lexington ...	Saint Louis, Kansas City and Northern.	76. 75	25
256	Va....	4782	11016	Lynchburgh, Danville	Washington City, Virginia Midland and Great Southern.	67. 28	30
257	Mich .	24022	24022	Port Huron, Flint	Chicago and Lake Huron	66. 59	20
258	N. Y..	1540	1235	Summitville, Ellenville	New York and Oswego Midland..	8	12
259	Wis ..	25020	25020	Warren, Mineral Point.....	Mineral Point	33	15
260	Wis ..	25006	25006	Horicon, Portage City	Chicago, Milwaukee & Saint Paul	45. 25	15
261	Pa....	2486	.....	Pittsburgh, Monongahela City.	Pittsburgh, Virginia & Charleston	31. 84	20
262	Me ...	214	14	Houlton, New Brunswick Line.	New Brunswick and Canada.....	3	20
263	Mich .	24020	24020	Lansing, Fort Wayne Junction.	Chicago and Lake Huron	166. 20	15
264	Fla ...	6401	16001	Fernandina, Cedar Keys....	Atlantic, Gulf and West India Transit Company.	154. 8	16
265	Ill	11923	23053	East Saint Louis, Murphysborough.	Cairo and Saint Louis.....	91	19
266	Wis ..	25022	25022	Tomah, Wausau	Wisconsin Valley.....	90. 04	20
267	Mo ...	28020	28020	Pierce City, Brownsville....	Memphis, Carthage and Northwestern.	48. 31	12
268	Iowa..	27009	27009	Villisca, Clarinda.....	Burlington and Missouri River ..	16	12
269	Me ...	231	.....	West Waterville, Madison..	Somerset	20. 61	20
270	Mo ...	28015	28015	Alexandria, Centreville.....	Missouri, Iowa and Nebraska....	85. 63	20
271	Iowa..	27030	27030	Des Moines, Ames	Des Moines and Minnesota.....	37. 12	18
272	Mass .	747	.....	Cohasset, South Duxbury...	Duxbury and Cohasset	18. 36	19
273	Ill	23013	23013	Mendota, Clinton	Chicago, Burlington and Quincy.	64. 19	12
274	Minn .	26007	26006	White Bear Lake, Sioux City Junction.	Minneapolis and Saint Louis.....	41	15
275	R. I...	823	.....	Providence, Pascoag.....	Providence and Springfield	23. 12	20
276	Ill	23027	23027	La Harpe, Burlington.....	Toledo, Peoria and Warsaw	19. 25	20
277	Minn .	26008	26008	Saint Paul, Stillwater.....	Lake Superior and Mississippi...	13. 20	22
278	Conn..	908	.....	Waterbury, Watertown	Naugatuck.....	54	20
279	Mo ...	28025	28025	Salisbury, Glasgow	Keokuk and Kansas City	15. 66	15
280	Ill	23025	23025	Maysville, Pittsfield	Toledo, Wabash and Western....	6	18

eyed, the accommodations for mails and agents, &c.—Continued.

reight car- ıy distance ·ty days.		Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Feet and inches.*				
8, 648	15, 018	6, 456	215	19 by 7.6, f. f., s. l.	7	$50 00		237
5, 506	18, 436	6, 430	214	9 by 6, fixtures, s. l.	6	50 00		238
8, 694	18, 422	6, 307	210	12 by 9.10, s. l.	6	50 00		239
3, 928	7, 744	6, 185	206	No apt	13½*	50 00	In October, 1874. $281.25 m. m.	240
5, 040	10, 631	6, 172	205	9 by 7, f f., s. l.	6	50 00		241
8, 043	15, 801	6, 083	202	9.6 by 7, f. f., s. l.	6	50 00	$60 m. m. Additional through mails occasionally.	242
3, 593	48, 683	5, 962	199	18 by 7.3, 13.1 by 6.8, f. f. c. and m. c., s. l.	6	50 00	In September, 1874. Main route ; branch $50, (258.)	243
5, 196	10, 106	5, 987	199	15.2 by 10, s. l.	6	50 00		244
1, 752	6, 471	5, 701	190	No r. a	12	50 00		246
5, 597	9, 445	5, 673	189	10 by 7, f. f., s. l.	6	50 00		247
7, 800	14, 317	5, 642	188	16.11 by 7.2, f. f., s. l.	6	50 00	In March, 1875	248
4, 286	10, 828	5, 630	187	14 by 9.3, f. f., s. l.	6	50 00	In October, 1874	249
7, 333	16, 270	5, 543	184	13.4 by 8, f. f., s. l.	6	50 00	In March, 1875	250
5, 793	12, 705	5, 544	184	14 by 7.6, fixtures, s. l.	6	50 00		251
2, 398	7, 206	5, 483	182	9 by 6.6, f. f., s. l.	6	50 00	Branch ; main route $50, (222.)	252
4, 653	11, 700	5, 488	182	8 by 7, f. f., s. l.	6	50 00		253
4, 293	11, 532	5, 426	180	12 by 7, f. f., s. l.	6	50 00	Branch ; main route $85, (106.)	254
8, 273	15, 839	5, 313	177	19.6 by 7.6, f. f., s. l.	6	50 00	In November, 1874	255
4, 837	8, 779	5, 230	174	15.6 by 7.9, fixtures, s. l.	6	50 00	In May, 1875	256
4, 306	10, 890	5, 221	174	9 by 7, f. f., s. l.	6	50 00		257
3, 007	6, 048	5, 215	173	No apt	12	50 00	Branch; main route $50, (243.) In July, 1874.	258
3, 292	8, 520	5, 147	171	19 by 9, f. f., s. l.	6	50 00		259
3, 550	11, 287	5, 139	171	23 by 10, f. f., s. l.	6	50 00		260
2, 783	7, 263	5, 059	168	10 by 8, f. f., s. l.	9*	50 00	In November, 1874	261
3, 479	5, 040	5, 040	167	12 by 8 ; no r. a	6	50 00	In June, 1874	262
9, 589	17, 576	5, 004	166	12.4 by 7.4, 9.10 by 6.2, fixtures, s. l.	6	50 00		263
5, 883	14, 254	4, 926	164	12 by 5.6, f. f., s. l.	6	50 00	In February, 1875	264
4, 123	14, 422	4, 840	161	8.9 by 6, f. f., s. l.	6	50 00	In September, 1874	265
3, 521	9, 634	4, 788	159	11 by 9.1, f. f., s l.	6	50 00		266
3, 460	10, 209	4, 756	158	10 by 6.10, f. f., s. l.	10¼*	50 00		267
1, 677	5, 007	4, 668	155	No r. a	12	50 00		268
2, 705	7, 048	4, 653	154	12.6 by 6.6, f. f., s. l.	6	50 00	In April, 1875	269
4, 849	12, 196	4, 603	153	9 by 8.8, f. f., s. l.	6	50 00		270
2, 482	6, 240	4, 566	152	8.3 by 5.6, f. f. ; no r. a	6	50 00	In March, 1875	271
3, 139	8, 167	4, 575	152	b. c. ; no r. a	12	50 00		272
4, 124	9, 341	4, 448	148	10.4 by 9.6, f. f. c., s. l.	6	50 00		273
5, 494	12, 328	4, 386	146	b. c. to Minneapolis, 15 m. ; 9.6 by 7, f. f., d. l., residue, 26 m.	9¾*	50 00		274
2, 818	7, 592	4, 319	143	No apt. ; no r. a	12	50 00	In March, 1875	275
2, 496	4, 572	4, 253	141	23 by 8.9, f. f., s. l.	6	50 00	Branch ; main route $64, (167.)	276
2, 729	8, 413	8, 413	140	b. c. ; no r. a	12	50 00	Paid from Stillwater. 60 days, in April and June, 1875.	277
1, 698	4, 627	4, 226	140	No r. a	12	50 00	Branch ; main route $95, (97.) In February, 1875.	278
1, 927	4, 644	4, 216	140	No r. a	12	50 00		279
2, 741	4, 100	4, 160	138	In b. c. ; no r. a	6	50 00	Branch ; main route $87.50, (103.)	280

E.—*Table showing the weight of the mails, the speed with which they*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Miles per hour.
						Miles.	
281	Tex ..	8683	31006	Mineola, Zavala.....	International and Great Northern	44½	10
282	Mich .	24037	24037	Saint Clair, Richmond	Michigan Midland and Canada...	16	76 20
283	Ill	23024	23024	Pekin, Decatur	Toledo, Wabash and Western....	68	46 25
284	Ill	23050	23050	Marshall, Danville	Paris and Danville.....	52	18
285	Wis ..	25023	25023	Madison, Portage City.....	Chicago, Milwaukee & Saint Paul. (operating Chicago & Superior.)	39	50 16
286	Iowa .	27006	27006	Chariton, Leon	Burlington and Missouri River ..	37	44 11
287	Ohio ..	9025	.....	Carey, Findlay.....	Cincinnati, Sandusky & Cleveland	16	...
288	Mich .	24037	24037	Saint Clair, Richmond	Michigan Midland and Canada...	16	76 20
289	La	8090	30002	New Orleans, Donaldsonville.	New Orleans, Mobile and Texas..	63	66 20
290	Mass .	731	653	South Braintree Junction, Fall River.	Old Colony, (late Old Colony and Newport.)	34	25
291	Mo ...	28013	28013	Brunswick, Pattonsburgh...	Brunswick and Chillicothe and Saint Louis, Council Bluffs and Omaha.	80. 05	15
292	Md ...	3501	.....	Perryville, Port Deposit	Philadelphia, Wilmington and Baltimore.	4	...
293	Mo ...	28017	23017	Sedalia, Lexington.....	Atlantic and Pacific	56. 25	20
294	Tex...	8684	31012	Indianola, Cuero	Gulf, Western Texas and Pacific	67. 2	12
295	Ill	23019	23019	Washington, Dwight	Chicago and Alton	70. 08	20
296	N. C ..	5007	13008	Charlotte, Buffalo Paper Mills.	Carolina Central.....	52½	20
297	Md ...	3517	.....	Berlin, Snow Hill	Worcester	14	14
298	Ohio ..	9037	.....	Springfield, Columbus	Cincinnati, Sandusky & Cleveland	45. 86	...
299	N. J ..	2126	.....	Eatontown, Port Monmouth	New Jersey Southern.....	9. 8	25
300	Ill	23007	23007	Aurora, Galena Junction....	Chicago, Burlington and Quincy .	13	15
301	Texas.	8683	31006	Phelps, Huntsville.....	International & Great Northern	8¼	10
302	Mich ..	24019	24019	Kalamazoo, South Haven ...	Michigan Central.....	39. 74	14
303	Iowa..	27013	27013	Stamwood, Tipton	Chicago and Northwestern	8. 81	21½
304	Mich ..	24026	24026	Grand Rapids, Newaygo....	Grand Rapids, Newaygo and Lake Shore.	36. 27	12
305	Mo....	28023	28023	Cuba, Salem	Saint Louis, Salem & Little Rock	40. 88	10
306	Iowa.	27023	27023	Beulah, Elkader	Iowa Eastern.....	17. 75	10
307	Minn .	26010	26010	Hastings, Glencoe.....	Chicago, Milwaukee & Saint Paul	74. 59	15
308	Wis ..	25008	25008	Oshkosh, Ripon.....	....do	21	25
309	Mass .	742	.....	Lynn, Marblehead.....	Eastern.....	6. 05	20
310	N. J ..	2127	.....	Whiting, Atco.....	New Jersey Southern.....	33. 3	20
311	Conn .	905	.....	Windsor Locks, Suffield.....	New York, New Haven & Hartford	4. 76	25
312	N. Y..	1294	.....	Watertown, Sackett's Harbor	Utica and Black River.....	12. 51	16
313	Utah .	16651	41003	Ogden, Franklin.....	Utah Northern	80. 5	12
314	N. J ..	2126	.....	Manchester, Barnegat Junction.	New Jersey Southern.....	20. 3	20
315	N. Y.	1805	.....	Thirtieth street, New York, Spuyten Duyvil.	New York Central and Hudson River.	10	...
316	N. H..	359	.....	Wing Road, Twin Mountain.	Boston, Concord and Montreal ...	9. 49	22½
317	Ill	23056	23056	Geneva, Batavia	Chicago and Northwestern.....	3. 50	15
318	Wis ..	25021	25021	Calamine, Plattville.....	Mineral Point.....	18. 70	15
319	Mo	28002	28002	Mineral Point, Potosi.....	Saint Louis, Iron Mountain and Southern, (late Saint Louis and Iron Mountain and Cairo and Fulton.)	4	8
320	Mass .	745	.....	Newton Junction, West Amesbury.	Boston and Maine	5. 05	20
321	Mass .	743	.....	Wakefield, Peabody.....	Eastern.....	8. 54	23
322	Pa	2495	.....	Berlin, Garrett	Buffalo Valley	8. 62	15
323	La	8098	30004	Terrebonne, Houma	Morgan's Louisiana and Texas ..	15. 28	15
324	Ill	23019	23019	Varna, Lacon.....	Chicago and Alton..	10. 55	20
325	Mich .	24027	24027	Niles, South Bend	Michigan Central.....	12. 20	15

yed, the accommodations for mails and agents, &c.—Continued.

eight car-y distance y days.		Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Feet and inches.*				
2, 582	6, 435	4, 028	134	8 by 7, f. f., s. l	6	$50 00	Branch: main route $125, (68.)	281
2, 757	4, 045	4, 045	134	Baggage apt.; no r. a	12	50 00	In December, 1874	282
5, 986	9, 809	3, 993	133	20 by 9.4, f. f., s. l	6	50 00		283
5, 066	7, 983	3, 838	127	14 by 6.6, f. f., s. l	6	50 00		284
3, 395	6, 079	3, 781	126	14 by 10, s. l	6	50 00		285
1, 482	5, 168	3, 774	125	6.10 by 6.4, f. f., s. l	6	50 00		286
1, 757	4, 035	3, 735	124			50 00	New weighing to be had	287
2, 710	3, 702	3, 702	123	No r. a	12	50 00	In March, 1875	288
2, 415	6, 649	3, 642	121	10 by 7.6, f. f., s. l	6	50 00		289
5, 255	13, 436	3, 640	121	b. c.; no r. a	12	50 00	$1,000 m. m. Corrected returns.	290
3, 353	9, 050	3, 512	117	9.3 by 9. s. l	6	50 00	In June, 1875	291
3, 925	10, 497	10, 497	116	No r. a	6	50 00	Branch; main route $440, (5.) 90 days, from Nov. 2, 1874.	292
3, 057	7, 352	3, 418	113	14 by 9.3, f. f., s. l	6	50 00		293
2, 045	5, 587	3, 308	110	9.6 by 6.5¼, f. f., s. l	6	50 00		294
5, 220	11, 021	3, 305	110	17 by 10, s. l	6	50 00	Main route; branch $50, (324.)	295
1, 886	5, 327	3, 106	103	14.2 by 9, f. f., s. l	6	50 00	In October, 1873; reported December, 1874.	296
963	3, 207	3, 089	102	7.6 by 4.6, f. f., s. l	6	50 00	In September, 1874	297
2, 996	5, 208	3, 085	102			50 00	New weighing to be had	298
3, 026	6, 984	3, 029	100	No r. a	8*	50 00	Branch; main route $75, (142.) In October, 1874.	299
2, 798	5, 534	3, 005	100	...do	12*	50 00	Branch; main route $273, (10.)	300
1, 117	2, 944	2, 944	98	In b. c	6	50 00	Branch; main route $125, (68.)	301
2, 418	6, 598	2, 880	96	12.7 by 6.6¾, f. f., s. l	6	50 00		302
1, 247	2, 887	2, 887	96	b. c.; no r. a	6	50 00		303
2, 621	6, 609	2, 830	94	10 by 5, f. f., s. l	6	50 00		304
2, 504	5, 771	2, 844	94	8 by 6, f. f., s. l	6	50 00		305
1, 624	3, 728	2, 818	93	8 by 6.6, fixtures, s. l	6	50 00		306
1, 855	6, 518	2, 619	87	23 by 10, f. f., s. l	3, 6	50 00	Trips, 3 in March, 6 in June, 1875.	307
1, 677	3, 483	2, 629	87	23 by 10, f. f., s. l	12	50 00		308
1, 364	2, 535	2, 535	84	b. c.; no r. a	6	50 00	In August, 1875	309
2, 010	4, 229	2, 496	83	8 by 6, f. f., s. l	6	50 00	In October, 1874. Speed in summer 25 miles per hour.	310
917	2, 490	2, 490	83	b. c.; no r. a	12	50 00	In August, 1875. Branch.	311
903	2, 715	2, 377	79	In b. c	12	50 00	In May, 1875	312
2, 077	6, 800	2, 335	78	29.6 by —, f. f., s. l	6	50 00	In September, 1874	313
2, 234	5, 326	2, 300	76	6 by 5, f. f., s. l	8¼*	50 00	Branch; main route $75, (142.) In October, 1874	314
1, 043	2, 042	2, 042	68		18	50 00	In April, 1875	315
1, 014	2, 752	1, 998	66	No r. a	6	50 00	In August, 1874. 12 trips in summer.	316
1, 034	1, 949	1, 949	64	b. c.; no r. a	6	50 00		317
917	2, 329	1, 645	54	No apt.; in b. c	6	50 00		318
632	1, 520	1, 520	50	In b. c.; no r. a	6	50 00	Branch; main route $100, (80.) In March, 1875.	319
813	1, 329	1, 329	44	b. c.; no r. a	12	50 00	In May, 1875	320
494	1, 556	1, 262	42	...do	6	50 00	In August, 1875	321
796	1, 257	1, 257	42	10 by 9, in charge of conductor.	21	50 00	In October, 1874	322
		1, 233	41	No apt., r. a., s. l	15*	50 00		323
771	1, 208	1, 208	40	15.2 by 10, f. f., c. & m. c.; no r. a.	6	50 00	Branch; main route $50, (295.)	324
501	1, 479	1, 203	40	No r. a	6	50 00		325

E.—*Table showing the weight of the mails, the speed with which they*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Miles per hour.
						Miles.	
326	N. J ..	2134	.....	Egg Harbor City, May's Landing.	May's Landing and Egg Harbor City.	7.43	21
327	Mass .	741	.....	Wenham, Essex	Eastern.	5.55	20
328	Mich	24024	24024	Ypsilanti, Bankers	Detroit, Hillsdale and Indiana	65.54	16
329	Vt	528		Wells River, Montpelier	Montpelier and Wells River	38.62	18
330	Ark ..	7502a	29002	Helena, Clarendon	Arkansas Central	48.02	20
331	Ohio ..	9042	.....	Newark, Shawnee	Newark, Somerset & Straitsville	44.04	25
332	Minn .	26012	26012	Austin, Mason City	Chicago, Milwaukee & Saint Paul.	41.38	20
333	Iowa	27024	27024	Clinton, Anamosa	Iowa Midland	74.1	20
334	Ohio ..	9044	.....	Marietta, Canal Dover	Marietta, Pittsburgh & Cleveland	99.96	20
335	Pa	2468	.....	Lewisburgh, Laurelton	Pennsylvania, (lessees Lewisburgh Center and Spruce Creek.)	20.73	15
336	Mich .	24015	24015	Saint Clair Junction, South Saginaw.	Flint and Pere Marquette	4.15	12
337	Mo ...	10525a	28025	Salisbury, Glasgow	Keokuk and Kansas City	15.66	15
338	Mich .	24033	24033	Ionia, Stanton	Detroit, Lansing and Lake Michigan.	25.31	25
339	Ala ...	6616	17016	Opelika, Alexander City	Savannah and Memphis	47.28	20
340	Ill	23014	23014	Rock Falls, Cornton	Chicago, Burlington and Quincy	47.23	11
341	Iowa.	27016	27016	Washington, Sigourney	Chicago, Rock Island and Pacific	29	20
342	Iowa..	27003	27003	Cedar Rapids, Traer	Burlington, Cedar Rapids and Minnesota.	24.77	15
343	Mo ...	10525a	28025	Salisbury, Glasgow	Keokuk and Kansas City	15.66	20
344	Minn	26005	26005	Fargo, Bismarck	Northern Pacific	195.12	16
345	Iowa..	27028	27028	Sabula, Marion	Chicago, Milwaukee & Saint Paul	87.75	18
346	Iowa..	27004	27004	Muscatine, Riverside	Burlington, Cedar Rapids and Minnesota.	32.23	16
347	Ill	23039	23039	Carbondale, Grand Tower	Grand Tower Mining, Manufacturing and Transportation Co	25	18
348	Ill	23004	23004	Elgin, Geneva	Chicago and Northwestern	44	22
349	Ill	23044	23044	Mattoon, Hervey City	Chicago and Illinois Southern, Consolidated.	31.66	15
350	Ohio ..	9050	.....	Painesville, Niles	Painesville and Youngstown	50.74	16
351	Wis ..	25007	25007	Nepeuskun, Winneconne	Chicago, Milwaukee & Saint Paul.	16.25	20
352	Wis ..	25018	25018	Manitowoc, Appleton	Milwaukee, Lake Shore and Western.	44.50	15
353	Ill	23049	23049	Springfield, Havana	Springfield and Northwestern	48.20	19
354	Ill	23045	23045	Carbondale, Marion	Carbondale and Shawneetown	18	18
355	Ill	23046	23046	Jacksonville, Virden	Jacksonville, Northwestern and Southeastern.	31.39	15
356	Mich .	24030	24030	East Saginaw, Saint Louis	Saginaw Valley and Saint Louis	35.19	20
357	Ind ...	22032	.....	Frankfort, Kokomo	Frankfort and Kokomo	25.50	25
358	N. J...	2129	.....	Atsion, Greenwich	Vineland	44¼	25
359	Ill	23054	23054	Chicago, Elgin	Chicago and Pacific	36	22
360	Pa	2483	.....	Montrose, Tunkhannock	Montrose	25.24	14
361	N. H..	352	.....	Nashua, Acton	Nashua, Acton and Boston	23.44	28
362	Pa	2490	.....	Mount Union, Broad Top	East Broad Top Railroad and Coal Co.	32.23	15
363	N. J...	2135	.....	Jersey City, Ringwood Furnace.	Montclair, (late New York and Oswego Midland.)	35.90	17
364	Ind ...	22030	.....	Attica, Veedersburgh	Indiana North and South	14	14
365	Ill	23022	23022	Joliet, Lake Station	Michigan Central	45	13
366	Md ...	3507	.....	Hagerstown, Williamsport	Western Maryland	6.12	20
367	Pa	2482	.....	Chambersburgh, Mont Alto	Mont Alto	14.75	15
368	Mich..	24015	24015	Otter Lake Junction, Otter Lake.	Flint and Pere Marquette	14.53	19
369	Ill	23042	23042	Bismarck, Youngstown	Chicago, Danville and Vincennes	25.90	15
370	Ill	23042	23042	.....do	.....do	25.90	15
371	Pa	2497	.....	Lawsonham, Sligo	Allegheny, (Sligo branch)	10.47	15
372	N. C ..	5002	13002	Rocky Mount, Tarborough	Wilmington and Weldon	17	15
373	La	8028	30007	Saint Francisville, Woodville	West Feliciana	27.57	10
374	Ind ..	22022	.....	Princeton, Albion	Louisville, New Albany and Saint Louis.	31.03	15
375	Iowa ..	27018	27018	Davenport, Maquoketa	Davenport and Saint Paul	42.76	16

conveyed, the accommodations for mails and agents, &c.—Continued.

le weight carried any distance thirty days.		Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Feet and inches.*				
67 382	949	949	32	In charge of conductor...	12	$50 00	In October, 1874.....	326
06 334	940	940	31	b. c.; no r. a.....	6	50 00	In August, 1875.....	327
43 6,873	14,016	5,908	196	7.6 by 5.6, f. f., s. l.....	6	45 00	.....	328
48 3,826	7,774	2,470	82	11.10 by 6.8, f. f., s. l.....	6	45 00	In October, 1874.....	329
05 1,317	2,922	1,958	65	8.5 by 6.4, f. f., s. l.....	6	45 00	.....	330
20 22,766	38,586	16,120	537	15 by 9, f. f., s. l.....	6	40 00	In August, 1874.....	331
40 5,079	8,489	5,851	195	23 by 10, f. f., s. l.....	6, 12	40 00	Trips, 6 in March, 12 in June, 1875.	332
93 5,160	13,753	5,493	183	12.4 by 7, f. f., s. l.....	6	40 00	.....	333
82 11,206	19,688	5,360	178	14.5 by 7.9, f. f., s. l.....	6	40 00	In March, 1875.....	334
32 2,600	7,632	5,178	172	8.6 by 6.8, f. f., d. l.....	12	40 00	In April, 1875. $107 m. m.	335
42 1,710	6,352	4,841	161	b. c.; no r. a.....	tem	40 00	Trips occasional, by courtesy. Branch; main route $96. (96.)	336
26 2,180	5,106	4,812	160	10 by 6.8.; no r. a.....	12	40 00	In December, 1874.....	337
80 2,187	5,767	2,682	156	10.6 by 9, fixtures, s. l.....	6	40 00	.....	338
68 2,841	6,609	4,603	153	9 by 5, f. f., s. l.....	6	40 00	In October, 1874.....	339
46 4,160	7,906	4,378	145	9.6 by 6.10, f. f., s. l.....	6	40 00	.....	340
88 1,845	6,333	4,237	141	6 by 5.6, f. f., s. l.....	6	40 00	.....	341
13 2,350	6,463	4,226	140	10.6 by 7.8, f. f., s. l.....	6	40 00	.....	342
95 1,348	3,743	3,743	124	8.6 by 8, f. f.; no r. a.....	6	40 00	In January, 1874.....	343
96 1,099	4,005	3,601	120	20 by 8.6, 20 by 8.8, 13 by 7.4, f. f. c., ½ l.	3	40 00	Part; residue $63, (170.)	344
50 3,756	9,206	3,279	109	18 by 8, f. f., s. l.....	6	40 00	.....	345
30 1,263	5,393	3,290	109	10.6 by 7.8, f. f., s. l.....	6	40 00	.....	346
57 1,861	4,518	3,135	104	No apt.....	9*	40 00	.....	347
37 3,010	8,147	3,085	102	9.6 by 9.5, f. f., s. l.....	6	40 00	.....	348
74 2,709	6,183	3,026	100	7.6 by 6.6, f. f., s. l.....	6	40 00	.....	349
16 3,439	8,955	2,929	97	5.8 by 5, s. l.....	6	40 00	In February, 1875.....	350
52 1,319	4,371	2,881	96	b. c.; no r. a.....	6	40 00	.....	351
07 2,551	5,358	2,724	90	11 by 7.10, f. f., s. l.....	6	40 00	Branch; main route $67, (161.)	352
23 3,338	6,861	2,611	87	18 by 9, f. f., s. l.....	8½*	40 00	.....	353
70 1,234	3,304	2,287	76	7.4 by 4, fixtures, s. l.....	6	40 00	.....	354
51 2,027	4,578	2,268	75	5.6 by 3.4, fixtures, s. l.....	6	40 00	.....	355
37 1,251	3,588	2,184	72	7 by 6, f. f., s. l.....	6	40 00	.....	356
78 1,899	3,577	2,075	69	10.7 by 7.1, f. f., s. l.....	6	40 00	In June, 1875.....	357
09 2,437	4,646	1,965	65	8 by 6, f. f., s. l.....	6	40 00	In October, 1874.....	358
05 2,277	5,382	1,861	62	22.6 by 10, f. f., s. l.....	6	40 00	In March, 1875.....	359
47 1,053	2,900	1,695	56	4.6 by 4.6, f. f., s. l.....	6	40 00	In July, 1874.....	360
82 1,153	2,235	1,630	54	6.10 by 6.8, fixtures.....	6	40 00	In June, 1874.....	361
44 1,542	3,886	1,609	53	No apt.; no r. a.....	6	40 00	In June, 1875.....	362
53 958	2,211	1,501	50	No. r. a.....	6	40 00	In December, 1874.	363
76 1,015	1,991	1,232	40	12 by 10; no r. a.....	6	40 00	In March, 1875.....	364
95 2,010	4,105	1,211	40	8.1½ by 6.1½, f. f., s. l.....	6	40 00	.....	365
30 414	1,144	1,144	38	10 by 5.6, furnished, d. l.....	12	40 00	Part; residue $75. In September, 1874.	366
12 393	1,005	1,005	33	b. c.; no r. a.....	6	40 00	In September, 1874.....	367
50 983	2,333	954	31	r. a. in b. c.....	6	40 00	Branch; main route $96. (96.)	368
10 571	1,381	835	27	Locked closet, 3 by 3; in charge of conductor.	6	40 00	Branch. In Jan., 1875.	369
78 769	1,447	838	27	3 by 3, locked.....	6	40 00	Branch; main route $54, (196.) In March, 1875.	370
47 226	573	573	19	No apt.; no r. a.....	6	40 00	In May, 1875.....	371
75 1,381	4,156	4,034	134	No r. a.....	7	35 76	Branch; main route $150, (53.) In March, 1875.	372
62 913	3,215	3,215	107	Box 2 by 5, locked; no r. a	3	35 00	.....	373
06 868	1,774	1,042	34	r. a. in corner of car, not partitioned, s. l.	6	35 00	.....	374
85 2,856	6,441	3,142	104	10.10 by 7, f. f., s. l.....	6	34 00	.....	375

E.—*Table showing the weight of the mails, the speed with which they*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Miles per hour.
						Miles.	
376	Mo....	28002	28027	Cairo, Poplar Bluff.....	Saint Louis, Iron Mountain and Southern, (late Saint Louis and Iron Mountain and Cairo and Fulton.)	73.73	15½
377	S. C ...	5612	14009	Anderson Court-House, Walhalla.	Greenville and Columbia, (lessees Blue Ridge.)	34	15
378	Mo....	10524*a*	28023	Cuba, Salem	Saint Louis, Salem and Little Rock.	40.88	10
379	Minn..	26014	26014	New Ulm, Marshall.....	Chicago and Northwestern.....	79.66	15
380	Miss ..	7008	18008	Middleton Station, Ripley ..	Ripley	24.30	15
381	Mich..	24032	24032	Muskegon, Big Rapids.....	Chicago and Michigan Lake Shore	56.64	20
382	Tenn..	10014	19013	Tracy City, Cowan.....	Tennessee Coal and Railroad Company.	23	12
383	Ala ...	6618	17018	Mobile, Jackson	Mobile and Alabama Grand Trunk	59.70	17
384	Mo....	10502	28002	Cairo, Poplar Bluff.....	Saint Louis and Iron Mountain and Cairo and Fulton.	73.73	15½
385	Wis...	25017	25017	Colby, Worcester	Wisconsin Central	49.90	18
386	Ga	6191	15023	Brunswick, Albany.....	Brunswick and Albany	171.25	14
387	Wis...	25017	25017	Colby, Medford	Wisconsin Central, (built and operated by Phillips & Colby Construction Company.)	16.30	12
388	Ill	23006	23006	Sagetown, Keithsburgh.....	Rockford, Rock Island and Saint Louis.	18	15
389	Pa	2487	.....	Valley Junction, Ebbvale...	Bachman Valley	13.3	14
390	La	8004	30006	Clinton, Port Hudson.....	Clinton and Port Hudson	21	7
391	Tex ...	8514	31008	Houston, Columbia	International and Great Northern	50	12
392	Ill	23057	23057	Saint Louis, Belleville	Illinois and Saint Louis.....	16.25	....
393	Tenn..	10011	19011	Knoxville, Careyville	Knoxville and Ohio	38.94	12
394	Va	4785	11017	Chester, Winterpock	Richmond and Petersburgh	18.50	15

onveyed, the accommodations for mails and agents, &c.—Continued.

le weight car-l any distance thirty days.		Average weight carried whole distance.		Size, &c., of mail-car or apartment.	Trips per week.	Pay per mile per annum.	Remarks.	Order.
Inward.	Total.	30 days, total.	Per day, total.					
Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Feet and inches.*				
62 3,000	7,562	3,736	124	10 by 6.5, s. l	6	$30 00	Branch of 28002: main route $100, (80.) In March, 1875.	376
90 2,519	5,609	3,093	103	b. c.; no r. a	6	30 00	In November and December, 1874.	377
03 2,485	5,588	3,041	101	7.6 by 6, f. f., s. l	6	30 00	In October, 1874	378
76 1,632	4,508	2,837	94	10.6 by 6.6, f. f., ½ l	3	30 00	Part: residue $65,(165.)	379
48 1,767	3,815	2,525	84	b. c.; no r. a	6	30 00	In September, 1874	380
82 2,696	5,778	2,266	75	11 by 7, f. f., s. l	6	30 00		381
63 1,411	2,274	1,906	63	No apt	6	30 00	In May, 1874	382
09 799	1,908	1,908	63	No apt.; no r. a	6	30 00	In October, 1874. $210 m. m.	383
77 2,358	4,635	1,723	57	10 by 6.5, ½ l	3½	30 00	Branch; main route $100, &c. Weight in December, 1874.	384
.....	.....	1,210	40	13.7 by 7.7, f. f., s. l	6	30 00	Part; residue $70,(156,) and $40, (157, rem.)	385
64 2,773	5,937	890	29	9.8½ by 6, ½ l	3	30 00	In April, 1875	386
29 459	988	743	24	13.7 by 7.7, f. f., s. l	6	30 00	In November, 1874	387
142 476	918	616	20	No apt; no r. a	6	30 00		388
370 848	1,718	424	14	In charge of conductor	6	30 00	In October, 1874	389
296 223	519	367	12	No r. a	3	30 00		390
279 1,474	2,753	1,665	55	In b. c	2	25 00		391
222 None	1,222	1,222	41	No r. a	3	25 00		392
339 1,360	3,699	1,933	64	4.1½ by 3, fixtures, s. l	6	22 88	In August, 1874	393
200 153	353	353	11	b. c; no r. a	6	20 00	In July, 1875	394

JAS. N. TYNER,
Second Assistant Postmaster-General.

Index to Table E.

Title.	Order.	Number of route.	New number of route.
Alabama Central	148	6609	.....
Allegheny, (Sligo branch)	371	2497	.....
Allegheny Valley	250	2480	.....
Annapolis and Elk Ridge	143	3508	.....
Arkansas Central	330	7502*a*	29002
Athol and Enfield. (See Springfield, Athol and Northeastern.)			
Atlanta and Richmond Air-Line	152	6017	15001
Atlantic and Pacific	11	28001	28001
Do	59	28003	28003
Do	192	28008	28008
Do	223	10508	28008
Do	293	28017	28017
Atlantic and Pacific, (lessees Pacific, of Missouri)	18	10501	28001
Do	249	10518*a*	28017
Atlantic and Pacific, (lessees South Pacific)	78	10503	28003
Atlantic, Gulf and West India Transit Company	264	6401	16001
Bachman Valley	389	2487	.....
Baltimore and Ohio	77	9011	.....
Do	86	3505	.....
Do	205	4101	.....
Do	230	3506	.....
Blue Ridge. (See Greenville and Columbia.)			
Boston and Maine	320	745	.....
Boston and Providence	34	608	.....
Do	61	608	.....
Boston, Barre and Gardner, (late Monadnock)	209	738	657
Boston, Concord and Montreal	316	359	.....
Brunswick and Albany	386	6191	15023
Brunswick and Chillicothe and Saint Louis, Council Bluffs and Omaha	291	28013	28013
Buffalo Valley	322	2495	.....
Burlington and Missouri River	27	27005	27005
Do	180	27005	27005
Do	181	27007	27007
Do	268	27009	27009
Do	286	27006	27006
Burlington and Southwestern	200	27008	27008
Burlington, Cedar Rapids and Minnesota	131	27001	27001
Do	235	27002	27002
Do	342	27003	27003
Do	346	27004	27004
Cairo and Saint Louis	238	23053	23053
Do	265	11923	23053
Cairo and Vincennes	154	23037	23037
Camden and Atlantic	214	2107	.....
Carbondale and Shawneetown	354	23045	23045
Carolina Central	225	5003	13003
Do	296	5007	13008
Central Branch Union Pacific	129	14002	33002
Central, of Iowa	210	27010	27010
Central Ohio	45	9001	.....
Charlotte, Columbia and Augusta	69	5601	13007
Chicago and Alton	36	23017	23017
Do	58	28022	28022
Do	63	23018	23018
Do	244	28021	28021
Do	295	23019	23019
Do	324	23019	23019
Chicago and Illinois Southern, Consolidated	349	23044	23044
Chicago and Lake Huron	257	24022	24022
Do	263	24020	24020
Chicago and Michigan Lake-Shore	105	24021	24021
Do	211	24021	24021
Do	381	24032	24032
Chicago and Northwestern	12	23003	23003
Chicago and Northwestern	17	23001	23001
Do	21	25009	25009
Do	22	23002	23002
Do	23	25012	25012
Do	107	24031	24031
Do	120	26015	26015
Do	127	25010	25010
Do	128	25010	25010
Do	138	25011	25011
Do	155	25010	25010
Do	160	25024	25013
Do	165	26014	26014
Do	187	26015	26015
Do	303	27013	27013
Do	348	23004	23004
Do	379	26014	26014
Chicago and Pacific	359	23054	23054
Chicago and Superior. (See Chicago, Milwaukee and Saint Paul.)			
Chicago, Burlington and Quincy	10	23007	23007
Do	38	23010	23010
Do	39	23010	23010
Do	40	23010	23010
Do	41	23010	23010
Do	51	23009	23009
Do	119	27011	27011
Do	121	27011	27011
Do	122	27011	27011
Do	123	27011	27011
Do	144	23011	23011
Do	178	23008	23008
Do	183	23012	23012
Do	186	23008	23008
Do	217	23007	23007
Do	273	23013	23013
Do	300	23007	23007
Do	340	23014	23014
Chicago, Danville and Vincennes	196	23042	23042
Do	369	23042	23042
Do	370	23042	23042
Chicago, Dubuque and Minnesota	179	27012	27012
Chicago, Milwaukee and Saint Paul	16	25002	25002
Do	25	26013	26013
Do	46	23035	23035
Do	70	25001	25001
Do	95	25005	25005
Do	100	26009	26009
Do	101	25003	25003
Do	195	27026	27026
Do	201	26011	26011
Do	218	25004	25004
Do	219	27025	27025
Do	260	25006	25006
Do. (operating Chicago and Superior R. R.)	285	25023	25023
Do	307	26010	26010
Do	308	25008	25008
Do	332	26012	26012
Do	345	27028	27028
Do	351	25007	25007
Chicago, Rock Island and Pacific	9	23015	23015
Do	13	27014	27014
Do	99	23016	23016
Do	175	27017	27017
Do	222	27015	27015
Do	252	27015	27015
Do	341	27016	27016
Cincinnati, Sandusky and Cleveland	92	9013	.....
Do	287	9025	.....
Do	298	9037	.....
Clinton and Port Hudson	390	8004	30006

Index to Table E.—Continued.

Title.	Order.	Number of route.	New number of route.
ntinental Improvement Co	194	24034	24034
mberland Valley	94	2430	.....
kota Southern	145	13929	.....
Do	168	35001	.....
venport and Saint Paul	236	27027	27027
Do	375	27018	27018
s Moines and Fort Dodge	149	27031	27031
s Moines and Minnesota	271	27030	27030
troit and Bay City	158	24013	24013
troit and Milwaukee	74	24006	24006
troit, Hillsdale and Indiana	328	24024	24024
troit, Lansing and Lake Michigan	162	24017	24017
Do	338	24033	24033
buque Southwestern	234	27020	27020
xbury and Cohasset	272	747	.....
st Broad Top Railroad and Coal Company	362	2490	.....
stern	309	742	.....
Do	321	743	.....
Do	327	741	.....
izabethtown and Paducah. (See Louisville, Paducah and Southwestern.)			
liott, W. P., owner Rogersville and Jefferson Railroad	198	10003	19003
lint and Pere Marquette	96	24015	24015
Do	184	24015	24015
Do	336	24015	24015
Do	368	24015	24015
rankfort and Kokomo	357	22032	22032
alveston, Harrisburgh and San Antonio	91	8504	31002
alveston, Houston and Henderson	49	8502	.....
Do	52	8502	31001
eneva, Ithaca and Athens	172	1293	.....
rand Rapids and Indiana	191	24038	24038
Do	207	24018	24018
rand Rapids, Newaygo and Lake Shore	304	24026	24026
rand Tower Mining, Manufacturing and Transportation Company	347	23039	23039
rand Trunk	110	24007	24007
reen Bay and Lake Pepin. (See Green Bay and Minnesota.)			
reen Bay and Minnesota, (late Green Bay and Lake Pepin)	233	25015	25015
reenville and Columbia, (lessees Blue Ridge Railroad)	377	5612	14009
ulf, Western Texas and Pacific	294	8684	31012
annibal and St. Joseph	14	28005	28005
Do	15	28010	28010
Do	151	28005	28005
empfield	226	2441	.....
ouston and Texas Central	76	8503	31003
Do	84	8505	31004
ouston and Texas Central, (operating Waco and Northwestern)	163	8577*a*	.....
linois and Saint Louis	392	23057	23057
linois Central	37	23020	23020
Do	57	23021	23021
Do	73	27021	27021
Do	169	27022	27022
ndiana and Illinois Central	248	23055	23055
ndianapolis and Saint Louis	19	11419	23028
Do	71	12024	22024
ndiana North and South	364	22030	.....
nternational and Great Northern	68	8683	31006
Do	202	8683 and 8666 pts.	.....
Do	253	8666	31007
International and Great Northern	281	8683	31006
Do	301	8683	31006
Do	391	8514	31008
Iowa Eastern	306	27023	27023
Iowa Midland	333	27024	27024
Iron Mountain, Chester and Eastern	247	23047	23047
Jacksonville, Northwestern and Southeastern	355	33046	23046
Jacksonville, Pensacola and Mobile	130	6402	.....
Kansas City, Saint Joseph and Council Bluffs	56	28006	28006
Do	176	28006	28028
Keokuk and Des Moines	109	27019	27019
Keokuk and Kansas City	279	28025	28025
Do	337	10525*a*	28025
Do	343	10525*a*	28025
Knoxville and Ohio	393	10011	19011
Lake Shore and Michigan Southern	67	24001	24001
Do	132	24004	24004
Do	136	24002	24002
Do	213	24003	24003
Do	216	24028	24028
Lake Superior and Mississippi	134	26006	26007
Do	277	26008	26008
Leavenworth, Lawrence and Galveston	90	14211	33008
Do	93	14003	33003
Do	221	14003	33003
Lewisburg Centre and Spruce Creek. (See Pennsylvania.)			
Louisville, New Albany and Saint Louis	374	22022	.....
Louisville, Paducah and Southwestern, (late Elizabethtown and Paducah)	108	9738	20011
Macon and Augusta	228	6145	15021
Marietta and Cincinnati	44	9032	.....
Do	75	9020	.....
Do	206	9019	.....
Marietta, Pittsburgh and Cleveland	334	9044	.....
May's Landing and Egg Harbor City	326	2134	.....
Memphis and Little Rock	85	7501	29001
Memphis, Carthage and Northwestern	267	28020	28020
Michigan Central	20	24005	24005
Do	133	24010	24010
Do	215	24009	24009
Do	232	24025	24025
Do	302	24019	24019
Do	325	24027	24027
Do	365	23022	23022
Michigan Lake Shore	241	24023	24023
Michigan Midland and Canada	282	24037	24037
Do	288	24037	24037
Midland Pacific	190	34005	.....
Milwaukee, Lake Shore and Western	161	25018	25018
Do	352	25018	25018
Mineral Point	259	25020	25020
Do	318	25021	25021
Minneapolis and Saint Louis	274	26007	26006
Mississippi Valley and Western	139	28018	28018
Missouri, Iowa and Nebraska	270	28015	28015
Missouri, Kansas and Texas	251	28024	28024
Missouri River, Fort Scott and Gulf	89	14005	33005
Mobile, Alabama, and Grand Trunk	383	6618	17018
Monadnock. (See Boston, Barre and Gardner.)			
Mont Alto	367	2482	.....

Index to Table E—Continued.

Title.	Order.	Number of route.	New number of route.
Montclair, (late New York and Oswego Midland)	363	2135	.....
Montpelier and Wells River	329	528	.....
Montrose	360	2483	.....
Morgan's Louisiana and Texas	55	8001	30003
Do	323	8098	30004
Nashua, Acton and Boston	361	352	.....
Naugatuck	97	908	.....
Do	278	908	.....
Newark, Somerset and Straitsville	331	9042	.....
New Bedford	82	641	.....
Do	98	642	.....
Do	240	639	.....
New Bedford, (operating Boston, Clinton and Fitchburgh)	137	746	.....
New Brunswick and Canada	262	214	14
New Orleans, Mobile and Texas	289	8090	30002
New Orleans, Saint Louis and Chicago	30	7001	18001
Do	31	8002	30001
Do	32	7001	18001
Do	35	7001	18001
New Jersey Southern	142	2126	.....
Do	310	2127	.....
Do	314	2126	.....
New York and Oswego Midland	243	1540	1235
Do	258	1540	1235
New York and Oswego Midland. (See Montclair.)			
New York Central and Hudson River	315	1805	.....
New York, New Haven and Hartford	4	907	.....
Do	6	905	.....
Do	7	907	.....
Do	8	905	.....
Do	311	905	.....
Northern Central	48	2421	.....
Northern Pacific	170	26005	26001
Do	344	26005	26001
North Louisiana and Texas	150	8005	30008
Ohio and Mississippi	26	12010	22010
Do	79	12018	22018
Old Colony, (late Old Colony and Newport)	81	654	634
Do	290	731	653
Oregon and California	87	44001	.....
Pacific, of Missouri. (See Atlantic and Pacific.)			
Painesville and Youngstown	350	9050	.....
Paris and Danville	284	23050	23050
Parker and Karns City	188	2495	.....
Pennsylvania	1	2103	.....
Do	2	2103 2104	.....
Do	3	2104	.....
Do	102	2103	.....
Do	174	2105	.....
Pennsylvania, (lessees Lewisburgh Centre and Spruce Creek)	189	2105	.....
Pennsylvania	193	2103	.....
Do	204	2105	.....
Do	335	2468	.....
Peoria and Rock Island	182	23040	23040
Peoria, Pekin and Jacksonville	146	23038	24038
Petersburgh	33	4410	11009
Philadelphia, Wilmington and Baltimore	5	3501	.....
Do	72	3401	.....
Do	292	3501	.....
Pittsburgh, Virginia and Charleston	212	2486	.....
Do	261	2486	.....
Portland and Ogdensburgh	173	202	12
Providence and Springfield	275	823	.....
Quincy, Alton and Saint Louis	114	23041	23041
Do	115	23041	23041
Do	117	23041	23041
Quincy, Missouri and Pacific	185	28019	28019
Richmond and Danville	64	5004	13004
Do	66	4407	11006
Richmond and Petersburgh	29	4409	11008
Do	394	4785	11017
Ripley	380	7008	18008
Rockford, Rock Island and Saint Louis	124	23005	23005
Do	388	23006	23006
Rogersville and Jefferson, (W. P. Elliott, owner)	198	10003	19003
Saginaw Valley and Saint Louis	356	24030	24030
Saint Clair and Chicago Air Line	246	24012	24012
Saint Louis, Alton and Terre Haute	83	23030	23030
Saint Louis and Iron Mountain and Cairo and Fulton	62	10502	28002
Do	384	10502	28002
Saint Louis and Saint Joseph. (See Saint Louis, Kansas City and Northern.)			
Saint Louis, Iron Mountain and Southern, (late Saint Louis and Iron Mountain and Cairo and Fulton)	80	28002	28002
Do	113	28002	28026
Do	319	28002	28002
Do	376	28002	28027
Saint Louis, Kansas City and Northern	43	28004	28004
Do	135	28007	28007
Do	197	28009	28009
Do	237	28012	28012
Saint Louis, Kansas City and Northern, (late Saint Louis and Saint Joseph)	255	10513	28012
Saint Louis, Lawrence and Western	140	28016 33011	.....
Do	147	28016	28016
Do	208	10517a	28016
Saint Louis, Salem and Little Rock	305	28023	28023
Do	378	10524a	28623
Saint Paul and Pacific	159	26002	26003
Do	224	26001	26002
Do	227	26003	26004
Saint Paul and Sioux City	125	26004	26005
Savannah and Memphis	339	6616	17016
Sheboygan and Fond du Lac	242	25019	25019
Sioux City and Pacific	106	27029	27029
Do	254	27029	27029
Sioux City and Saint Paul	126	26004	26018
Sligo Branch. (See Allegheny.)			
Somerset	269	231	.....
Southern Minnesota	177	26016	26016
Springfield and Illinois Southeastern	141	23033	23033
Springfield and Northwestern	353	23049	23049
Springfield, Athol and Northeastern, (late Athol and Enfield)	223	658	741
Sycamore and Courtland	229	23052	23052
Tennessee Coal and Railroad	382	10014	19013
Terre Haute and Indianapolis	24	22002	.....
Do	28	12002	22002
Do	42	23031	23031
Do	47	11425	23031
Texas and Pacific	60	8749	31010
Do	116	8506	.....
Do	118	8506	31009
Do	164	8770	.....
Do	166	8770	31011
Do	202	8749	.....
Toledo, Canada Southern and Detroit	104	12956	24035

Index to Table E—Continued.

Title.	Order.	Number of route.	New number of route.
oledo, Peoria and Warsaw	167	23027	23027
Do	276	23027	23027
oledo, Wabash and Western	50	23023	23023
Do	103	23025	23025
Do	239	23026	23026
Do	280	23025	23025
Do	283	23024	23024
tah Northern	313	16651	41003
tah Southern	171	41002	.....
Do	199	41002	.....
tica and Black River	312	1294	.....
ineland	358	2129	.....
'ashington and Ohio	231	4404	11004
'ashington City, Virginia Midland and Great Southern	256	4782	11016
'estern and Atlantic	65	6002	15002
'estern Maryland, (extension)	366	3507	.....
Western Union	153	25013	25024
West Feliciana	373	8028	30007
Wilmington and Weldon	53	5002	13002
Do	372	5002	13002
Wilmington, Columbia and Augusta	54	5604	14002
Do	88	5604	14002
Wisconsin Central, (operated by Phillips & Colby Construction Company)	111	25016	25016
Do	112	25016	25016
Do	156	25017	25017
Do	157	25017	25017
Do	385	25017	25017
Do	387	25017	25017
Wisconsin Valley	266	25022	25022
Worcester	297	3517	.....

F.—*Table showing the re-adjustment of the rates of pay per mile on railroad routes in State and on certain new routes the adjustment of the rates, based upon returns of the weight of and the number of trips per week, in accordance with the act of March* 3, 1873.

[ABBREVIATIONS.—f. f., fixtures and furniture; f. f. c., fixtures and furniture complete; m. c., mail-line; r. a., route agents; m. m., mail messenger. A number followed by an asterisk (*) shows the in parentheses in the "Remarks" column refer to the order of the routes in this table.]

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails whole distance per day.	Miles per hour.
						Miles.	*Pounds.*	
1	N. J ..	2103	.....	New York, West Philadelphia.	Pennsylvania	90	32,852	30
2	Conn .	907	.....	New Haven, New York	New York, New Haven and Hartford.	76½	32,617	30
3	Md ...	3501	.....	Baltimore, Philadelphia.	Philadelphia, Wilmington and Baltimore.	96	25,152	33
4	Conn .	905	.....	New Haven, Springfield.	New York, New Haven and Hartford.	63 5-6	25,207	30
5	Conn .	907	.....	New Haven, New York	.....do	76½	23,359	30
6	Conn .	905	.....	New Haven, Springfield.	.....do	63 5-6	18,694	30
7	Ohio ..	9032	.....	Cincinnati, Parkersburgh.	Marietta and Cincinnati	206	12,512	25
8	Ill	23015	23015	Geneseo, Davenport ..	Chicago, Rock Island and Pacific.	24	12,525	24
9	Ill	23007	23007	Chicago, Burlington ..	Chicago, Burlington and Quincy.	207.70	11,266	30
10	Ill	23015	23015	Chicago, Geneseo	Chicago, Rock Island and Pacific.	159	12,525	24
11	Iowa .	27014	27014	Davenport, Iowa City.	.....do	54	8,747	23

which the contract term expired June 30, 1875, and also in other States and Territories, mails, the speed with which they are conveyed, the accommodations for mails and agents,

here; r. p. o., railway post-office; apt., apartment; b. c., baggage car; s. l., single line; d. l., double valent in round trips, a more particular statement in tabular form being inconvenient. The figures

, &c., of mail ar or apart- ent.	Trips per week.	Pay per mile per annum.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of re-adjustment or adjustment.	Remarks.	Order.
t and inches.		*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*			
o., 49.4 by 8.4, .3 by 8.4, 47.3 8.4, 46 by 8.8, f., d. l.; r. a. ts., 15.6 by 6.5½, verage) f. f., d. and extra s. l. local trains, .3 miles.	74*	628 00	567 00	56,520 00	50,544 00	Oct. 1, 1874	90 days, from Nov. 2, 1874. Extended to cover route 2104. 54 miles formerly at $558 per mile. Extra trips on local trains. Main route; branches $55 (199) and $88, (110.)	1
o., 48 by 8.7, by 8.10, f. f. c. d m. c., d. l.; a. apts., 15 by , 13.6 by 6.9, f. c. and m. c., lines; and r. in b. c., s. l.	40⅛*	595 00	479 00	45,418 33	36,563 66	Oct. 1, 1874	77 days, from Jan 1, 1875.	2
o., 50 by 9, f. d. l.; r. a. apt., by 9, f. f., s. l. Wilmington, .7 miles; 3½ ies residue, .6 miles; and tra in apt. 9 3.6, f. f., d. l., yond Lamon, 13.9 miles.	31*	538 00	440 00	51,648 00	44,000 00	July 1, 1874	90 days, from Nov. 2, 1874. Main route; branch $50. Returns show distance to be 96 miles; formerly stated at 100 miles. Ordered April, 1875.	3
o., 48 by 8.7, by 8.10, f. f. c. d m. c., d. l.; a. apt., 9.3 by , f. f. c. and . c., s. l.; and a. in b. c., s. l.	34*	497 00	416 00	31,725 16	26,554 66	Oct. 1, 1874	77 days, from Jan. 1, 1875.	4
. o., 48 by 8.7, by 8.10, f. f. c. d m. c., d. l.; a. apts., 15 by , 13.6 by 6.9, f. c., and m. c., lines; and r. in b. c., s. l.	37	479 00	375 00	36,563 66	28,625 00	July 1, 1873	In June, 1874. Ordered March, 1875.	5
. o., 48 by 8.7, by 8.10, f. f. c. d m. c., d. l.; a. apt., 9.3 by 4, f. f. c., and . c., s. l.; and a. in b. c., s. l.	34*	416 00	325 00	26,554 66	20,745 83	July 1, 1873	....do	6
. o., 52.4 by 6¼, f. f., d. l.	16⅝*	373 00	175 00	76,838 00	36,050 00	July 1, 1873	In Aug., 1874. Ordered Oct., 1874.	7
o., (say) 40 by .2, f. f. c. and . c., d. l.	15¼*	344 00	305 00	8,256 00	7,320 00	July 1, 1875	Part; residue $319, (10.) r. p. o., with platforms, 48.6 by 10.2.	8
. o., 55.6 by 9.6, f. c. and m. c., . l.	21¼*	328 00	273 00	68,125 60	56,702 10	July 1, 1875	Main route; branches $58 (183) and $50. Special train every third Sunday.	9
. o., (say) 40 by .2, f. f. c. and . c., s. l.	15¼*	319 00	280 00	50,721 00	44,520 00	July 1, 1875	Part; residue $344, (8.) r. p. o., with platforms, 48.6 by 10.2.	10
. o., (say) 40 by 0, f. f. c. and m. ., d. l.	12	295 00	275 00	15,930 00	14,850 00	July 1, 1875	Part; residue $270, (12.) r. p. o., with platforms, 49.7 by 10.	11

F.—*Table showing the re-adjustment of the rates of pay per mile on railroad routes*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails whole distance per day.	Miles per hour.
						Miles.	*Pounds*	
12	Iowa	27014	27014	Iowa City, Missouri River.	Chicago, Rock Island and Pacific.	264	8,747	23
13	Ill	23003	23003	Chicago, Union Pacific Transfer.	Chicago and Northwestern	491	8,462	23
14	Ohio	9001	.....	Bellaire, Columbus	Central Ohio	137⅞	7,178	23½
15	Mo	10501	28001	Saint Louis, Atchison	Atlantic and Pacific	329.75	8,010	24
16	Ind	12010	22010	Cincinnati, East Saint Louis.	Ohio and Mississippi	341	6,136	25
17	Ind	12010	22010	.....do	.....do	341	6,136	25
18	Iowa	27005	27005	Burlington, East Plattsmouth.	Burlington and Missouri River	279.14	5,891	21
19	Mo	28005	28005	Quincy, Saint Joseph	Hannibal and Saint Joseph	203.50	6,214	22
20	Wis	25002	25002	Milwaukee, La Crosse	Chicago, Milwaukee and Saint Paul.	198	6,581	21
21	Mo	28010	28010	Kansas City, Cameron	Hannibal and Saint Joseph	54	6,164	22
22	Ind	12010	22010	Cincinnati, East Saint Louis.	Ohio and Mississippi	341	6,136	25
23	Ill	23001	23001	Chicago, Milwaukee	Chicago and Northwestern	87	4,293	22
24	Wis	25009	25009	Chicago, Green Bay	.....do	245	4,507	22
25	Mo	28001	28001	Saint Louis, Atchison	Atlantic and Pacific	329.75	5,247	24
26	Mich	24005	24005	Detroit, Chicago	Michigan Central	284	4,623	28½
27	Ill	23017	23017	Chicago, East Saint Louis.	Chicago and Alton	283	4,091	25
28	Va	4409	11008	Richmond, Petersburgh.	Richmond and Petersburgh	24.50	2,815	27
29	Ind	12002	22002	Indianapolis, Terre Haute.	Terre Haute and Indianapolis	73	4,913	28
30	Ill	23002	23002	Chicago, Freeport	Chicago and Northwestern	121	4,184	22
31	Ga	6002	15002	Atlanta, Chattanooga	Western and Atlantic	138.75	3,826	25
32	Ill	23031	23031	East Saint Louis, Terre Haute.	Terre Haute and Indianapolis	165.40	5,396	34
33	Va	4410	11009	Petersburgh, Weldon	Petersburgh	65.51	2,272	20
34	Minn	26013	26013	Saint Paul, Winona	Chicago, Milwaukee and Saint Paul.	103.84	3,685	20
35	Ill	23035	23035	Chicago, Milwaukee	.....do	88.85	5,778	27
36	Ill	23020	23020	Chicago, Cairo	Illinois Central	365	3,604	21

s in which the contract term expired June 30, 1875, &c.—Continued.

, of mail apart-	Trips per week.	Pay per mile per annum.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of re-adjustment or adjustment.	Remarks.	Order.
l inches.		*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*			
ıay) 40 by c. and m.	12	270 00	250 00	71, 2-0 00	66, 000 00	July 1, 1875	Part; residue $295, (11.) r. p. o., with platforms, 49.7 by 10.	12
50 by 9.5,).4, (aver- 6 by 9.4¼,) l.	13*	268 00	255 00	131, 588 00	127, 730 00	July 1, 1875	139 miles formerly at $275. 1 mile increase.	13
1.6 by 8.9, l.	19	267 00	175 00	36, 812 62	24, 128 12	July 1, 1873	In August, 1874. Ordered Jan., 1875.	14
3.6 by 9.6, ınd m. c.,	13¾*	262 00	215 00	86, 994 50	65, 807 50	July 1, 1873	In Oct., 1874. 44¼ miles formerly at $100. Ordered Dec., 1874.	15
50 by 9, f. m. c., s. l.	16½*	254 00	239 00	86, 614 00	81, 499 00	Jan. 1, 1874	In July, 1874. Ordered Dec., 1874.	16
50 by 9, f. c., s. l.; r. dditional, 11, f. f., s. orth Ver- 4 miles.	16½*	254 00	254 00	88, 424 00	86, 614 00	Sept. 16, 1874	In July, 1874. 72.4 miles at $279. Ordered Dec., 1874.	17
2.1 by 9.6, s. l.	12	250 00	200 00	69, 765 00	55, 828 00	July 1, 1875	Main route; branch $68, (158.) Special train every third Sunday.	18
0 by 10, f. l., to Cam- 171 miles; sidue.	11¾*	240 00	237 50	48, 027 50	48, 331 25	July 1, 1875	$215 per mile for 32.5 miles. Main route; branch $50, (228.)	19
ıay) 40 by f. c., s. l.	12	244 00	230 00	48, 312 00	45, 540 00	July 1, 1875	r. p. o., with platforms, 46.6 by 10.3.	20
0 by 10, f. l.	13	239 00	232 00	13, 636 00	13, 258 00	July 1, 1875	$730 for ferriage.....	21
1 by 11, f.	16½*	239 00	200 00	81, 499 00	68, 200 00	July 1, 1873	In July, 1874. Ordered Dec., 1874.	22
5 by 10, f.	25	232 00	220 00	20, 184 00	19, 140 00	July 1, 1875	.....	23
) by 10, f. l.	14¼*	230 00	210 00	56, 350 00	51, 450 00	July 1, 1875	.....	24
3.6 by 9.6, nd m. c.,	13¾*	228 00	262 00	75, 183 00	86, 994 50	July 1, 1875	In April, 1875.....	25
5 by 10, f.	32½*	223 00	212 50	63, 332 00	60, 350 00	July 1, 1875	.....	26
5 by 9.10, nd m. c., . a. apt., 10, f. f. c. c., s. l., les.	18½*	214 00	195 00	60, 562 00	55, 185 00	July 1, 1875	.....	27
2 by —, f. l.	13	213 00	200 00	5, 368 50	5, 050 00	July 1, 1873	In June, 1875. Ordered Sept., 1875. $150 m. m.	28
11 by 7.6, l. l.	22*	208 00	200 00	15, 184 00	14, 600 00	July 1, 1873	In July, 1874. Ordered Feb., 1875.	29
.8 by 9.5,	14*	208 00	210 00	25, 168 00	25, 410 00	July 1, 1875	.....	30
by 8.7, f.	14	205 00	125 00	28, 443 75	17, 343 75	May 20, 1874	In Oct., 1874. Ordered Jan., 1875.	31
f. f., s. l.; ail room, .6.	16*	204 00	184 00	33, 741 60	30, 433 60	July 1, 1875	.....	32
by —, f. l.	13	204 00	200 00	13, 364 04	13, 102 00	July 1, 1875	In June, 1875.....	33
ay) 40 by f. c., s. l.	12	203 00	207 00	21, 079 52	21, 494 88	July 1, 1875	r. p. o., with platforms, 46.6 by 10.3.	34
.....	18	200 00	175 00	17, 770 00	15, 548 75	July 1, 1875	.....	35
.6 by 8.9, ınd m. c., Kanka- miles; s. ıe; r. a. 2 by 8, s. ankakee	15*	200 00	195 00	74, 375 00	73, 375 00	July 1, 1875	55 miles at $225; formerly at $235.	36

F.—*Table showing the re-adjustment of the rates of pay per mile on railroad routes*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails whole distance per day.	Miles per hour.
						Miles.	*Pounds.*	
37	Ind...	12024	22024	Indianapolis, Terre Haute.	Indianapolis and Saint Louis..	72	3,318	26
38	Wis..	25012	25012	Winona, Winona Junction.	Chicago and Northwestern....	30.45	3,280	20
39	Ill....	23023	23023	Decatur, East Saint Louis.	Toledo, Wabash and Western.	112	4,274	25
40	Ill....	11419	23028	Terre Haute, East Saint Louis.	Indianapolis and Saint Louis .	189	2,638	26
41	Ill....	11425	23031	East Saint Louis, Terre Haute.	Terre Haute and Indianapolis.	165.40	4,080	22
42	La....	8002	30001	New Orleans, Canton.	New Orleans, Saint Louis and Chicago.	206	2,373	20
43	Miss..	7001	18001	Canton, Milan Depot.	.....do	258	2,313	20
44	Miss..	7001	18001	Milan Depot, Cairo...	.....do	84.98	2,313	20
45	Ind...	12018	22018	Jeffersonville, North Vernon.	Ohio and Mississippi.....	53.5	2,061	27
46	Ill....	23009	23009	Peoria, Galesburgh ..	Chicago, Burlington and Quincy.	54	1,991	26
47	Ill....	23021	23021	Dubuque, Centralia ..	Illinois Central	344	2,451	20
48	Mo ...	28006	28006	Kansas City, Union Pacific Transfer.	Kansas City, Saint Joseph and Council Bluffs.	203.50	1,980	....
49	N. C ..	5002	13002	Weldon, Wilmington.	Wilmington and Weldon.....	163	2,755	22
50	Va....	4407	.....	Richmond, Greensborough.	Richmond and Danville.....	190.5	3,219	19
51	Ill....	23041	23041	Quincy, Hannibal	Quincy, Alton and Saint Louis.	19.4	1,531	20
52	N. C ..	5004	13004	Greensborough, Charlotte.	Richmond and Danville.....	93	2,860	19
53	Ohio ..	9020	.....	Portsmouth, Reed's Mills.	Marietta and Cincinnati	56	2,506	20
54	Del ...	3401	.....	Wilmington, Seaford .	Philadelphia, Wilmington and Baltimore.	84	1,953	22
55	Mo ...	28002	28026	Bismarck, Texarkana.	Saint Louis, Iron Mountain and Southern, (late Saint Louis and Iron Mountain and Cairo and Fulton.)	406.41	2,851	20½
56	S. C...	5604	14002	Florence, Wilmington	Wilmington, Columbia and Augusta.	109.7	2,311	25
57	Mo ...	28004	28004	Saint Louis, Kansas City.	Saint Louis, Kansas City and Northern.	271.75	2,306	22
58	Tex ..	8503	.....	Houston, Denison City	Houston and Texas Central...	337.55	2,181	25
59	Tex ..	8502	.....	Houston, Galveston ..	Galveston, Houston and Henderson.	50	2,157	20
60	Ohio ..	9011	.....	Newark, Sandusky...	Baltimore and Ohio	116	2,157	25
61	Minn .	26011	26011	Winona, La Crescent.	Chicago, Milwaukee and Saint Paul.	25	2,679	17

in States in which the contract term expired June 30, 1875, *&c.*—Continued.

Size, &c., of mail car or apartment.	Trips per week.	Pay per mile per annum.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of re-adjustment or adjustment.	Remarks.	Order.
Feet and inches.		*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*			
r. p. o., 39.4 by 9, f. f., a. l.	18	196 00	115 00	14,112 00	8,280 00	July 1, 1873	In October, 1873; ordered Jan., 1875.	37
r. p. o., 40 by 10, f. f., a. l.; r. a. apt., 12 by 9.6, f. f., a. l.	12	195 00	209 00	5,937 75	5,852 00	July 1, 1875	2.45 miles increase ..	38
20 by 9.4, f. f., a. l.	12	187 00	158 00	20,944 00	17,696 00	July 1, 1875	.....	39
r. p. o., 39.4 by 9, f. f., a. l.	18	185 00	215 00	34,965 00	40,635 00	July 1, 1873	In October, 1873; ordered Dec., 1874.	40
22 by 7.6, 11 by 7.6, f. f. c., a. l.	22*	184 00	175 00	30,433 60	28,945 00	July 1, 1873	In July, 1874; ordered Dec., 1874.	41
r. p. o., 42 by 9, f. f. c., a. l.	13	181 00	200 00	37,286 00	41,200 00	July 1, 1873	90 days, from Nov. 1, 1874.	42
r. p. o., 42 by 9, f. f. c., a. l.	13	180 00	200 00	46,440 00	51,600 00	July 1, 1873	90 days, from Nov. 1, 1874. Part; residue new, $180. (44.)	43
r. p. o., 42 by 9., f. f. c., a. l.	13	180 00	.....	.....	.....	Dec. 20, 1873	90 days, from Nov. 1, 1874. New. Part; residue $180, (43.)	44
r. p. o., 41 by 11, f. f., a. l.; r. a. apt., 20.6 by 11, f. f., a. l.	18	175 00	150 00	9,362 50	8,025 00	Sept. 16, 1874	Ordered Dec., 1874 ..	45
r. p. o., 44.11 by 9.6, f. f. c. and m. c., a. l.; and r. a. in b. c., 3 miles.	12½*	175 00	155 00	9,450 00	8,370 00	July 1, 1875	.....	46
r. p. o., 27.6 by 9, f. f. c., a. l.	12	174 00	140 00	59,856 00	48,160 00	July 1, 1875	.....	47
r. p. o., 40 by 10, f. f. c., a. l.	14*	174 00	143 00	35,409 00	29,100 50	July 1, 1875	Branch detached....	48
16.8½ by 7.10½., f. f., d. l.	13	172 00	150 00	28,036 00	24,450 00	July 1, 1873	60 days, in Mar. and April, 1875. Speed at night 15 miles per hour. Main route; branch $51, (246.) Ordered July, 1875.	49
18 by 9, f. f., a. l...	15¾*	170 00	128 00	32,385 00	24,384 00	Apr. 1, 1875	.....	50
r. p. o., (say) 51.2 by 9.10., f. f., a. l.; r. a. apt., 15.6 by 8.10, f. f., a. l.	19	165 00	85 00	3,201 00	1,649 00	Mar. 23, 1875	Part; residue $85. r. p. o., size, "over all," 57. 6.	51
18 by 9., f. f., a. l..	14	164 00	126 00	15,252 00	11,718 00	Apr. 1, 1875	In April, 1875. Part; residue $75.	52
17 by 8.7½, f. f., a. l.	12	158 00	100 00	8,848 00	5,600 00	July 1, 1873	In August, 1874; ordered Oct., 1874.	53
24 by 9, 19 by 8, f. f., d. l.	12	157 00	115 00	13,188 00	9,660 00	July 1, 1874	90 days, from Nov. 2, 1874. Part; residue $125, (79;) ordered June, 1875.	54
24.8 by 8.11., a. l..	7	155 00	80 00	62,993 55	39,733 30	July 1, 1875	In Mar., 1875. 144.41 miles formerly at $130; formerly branch of route 28002.	55
18.1½ by 8.9, f. f., a. l.	13	155 00	150 00	17,003 50	16,455 00	July 1, 1873	60 days, in Mar. and April, 1875. Speed 21 miles in daytime. Part; residue $100; ordered July, 1875.	56
24 by 7.6., f. f., a. l.	14¾*	155 00	180 00	42,121 25	48,915 00	July 1, 1875	.....	57
21 by 7.3, f. f. c., a. l.	10¾*	153 00	100 00	51,645 15	34,035 00	July 1, 1873	In October, 1874. 2.8 miles decrease; ordered Jan., 1875.	58
15.10 by 6.9, f. f., a. l.	18	152 00	160 00	7,600 00	8,000 00	July 1, 1873	In October, 1874; ordered Jan., 1875.	59
16.6 by 6.6. f. f., a. l	18	152 00	100 00	17,632 00	11,600 00	July 1, 1873	In August, 1874; ordered Jan., 1875.	60
No r. a.....	12	150 00	50 00	3,750 00	1,250 00	July 1, 1875	.....	61

F.—*Table showing the re-adjustment of the rates of pay per mile on railroad routes*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails whole distance per day.	Miles per hour.
						Miles.	*Pounds.*	
62	Tex...	8749	31010	Marshall, Texarkana.	Texas and Pacific.....	74	2,633	18½
63	Mich .	24001	24001	Toledo, Detroit.....	Lake Shore and Michigan Southern.	65.27	2,330	25
64	Ind...	12018	22018	Jeffersonville, North Vernon.	Ohio and Mississippi.....	53.5	2,061	27
65	Me...	202	12	Portland, Bartlett....	Portland and Ogdensburgh....	72.85	1,801	22
66	Mass .	608	.....	Boston, Providence...	Boston and Providence.....	44	2,252	26
67	Tex...	8502	31001	Houston, Galveston ..	Galveston, Houston and Henderson.	50	1,918	19
68	Mo ...	28002	28002	Saint Louis, Columbus	Saint Louis, Iron Mountain and Southern, (late Saint Louis and Iron Mountain and Cairo and Fulton.)	197	1,897	21
69	Mo ...	28022	28022	Road House, Mexico..	Chicago and Alton.....	90	1,505	24
70	Mo ...	10503	28003	Pacific, Vinita.....	Atlantic and Pacific	327.25	2,142	22
71	Mass .	654	634	South Braintree Junction, Newport.	Old Colony, (late Old Colony and Newport.)	61.75	1,817	30
72	Tex ..	8683	31006	Longview, Houston ..	International and Great Northern.	236	1,824	21
73	Mass .	642	.....	Taunton, New Bedford.	New Bedford	20.5	1,672	28
74	Wis ..	25010	25010	Caledonia Station, Elroy.	Chicago and Northwestern....	135.45	1,642	20
75	Ill...	23025	23025	Hannibal, Naples.....	Toledo, Wabash and Western.	45.50	1,638	20
76	Mass .	608	.....	Boston, Providence...	Boston and Providence.....	44	1,796	26
77	Tex...	8749	.....	Marshall, Texarkana.	Texas and Pacific.....	74	1,763	24
78	Mo ...	10502	28002	Argenta, Texarkana..	Saint Louis and Iron Mountain and Cairo and Fulton.	144.41	1,668	21
79	Del ...	3401	.....	Seaford, Delmar	Philadelphia, Wilmington and Baltimore.	13.02	1,953	22
80	Mass..	641	.....	Taunton, Mansfield ..	New Bedford	12	1,584	22
81	Tex...	{8683} {8666}	8683	Houston, Longview ..	International and Great Northern.	236	1,561	24
82	Iowa..	27021	27021	Dubuque, Sioux City.	Illinois Central	327.12	1,534	20
83	Ill	23030	23030	East Saint Louis, Du Quoin.	Saint Louis, Alton and Terre Haute.	71.80	1,395	23
84	Conn	908	.....	Bridgeport, Winsted	Naugatuck	62	1,173	20
85	Mo ...	28003	28003	Pacific, Vinita.....	Atlantic and Pacific	327.25	1,400	22
86	Mich	24006	24006	Detroit, Grand Haven	Detroit and Milwaukee.....	189.67	1,377	25
87	Ill	23018	23018	Road House, Godfrey	Chicago and Alton	40.60	1,262	24
88	La	8001	30003	New Orleans, Brashear	Morgan's Louisiana and Texas	83	1,298	21
89	Minn .	26004	26005	Saint Paul, Saint James	Saint Paul and Sioux City	122	1,122	20
90	Iowa..	27029	27029	Missouri Valley, Sioux City.	Sioux City and Pacific	76	1,122	25
91	Ark ..	7501	29001	Memphis, Argenta ...	Memphis and Little Rock.....	134	1,163	15

es in which the contract term expired June 30, 1875, *&c.*—Continued.

c., of mail or apart-t.	Trips per week.	Pay per mile per annum.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of re-adjustment or adjustment.	Remarks.	Order.
nd inches.		*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*			
7.9, f. f., s. l	6	150 00	130 00	11,100 00	9,620 00	July 1, 1875	.....	62
8.9¾, f. f., 5 miles; b. idue.	50¼*	150 00	125 00	9,790 50	8,158 75	July 1, 1875	.....	63
11, f. f., s. l.	18	150 00	100 00	8,025 00	5,350 00	July 1, 1873	In July, 1874; ordered Dec., 1874.	64
7½, f. f., d. l.	12	150 00	60 00	10,927 50	4,371 00	July 1, 1873	In June, 1874; ordered Dec., 1874.	65
.; no r. a..	27¼*	145 00	130 00	6,380 00	5,720 00	Apr. 1, 1875	In May, 1875.....	66
; 6.9, fix-, s. l.	19	145 00	152 00	7,250 00	7,600 00	July 1, 1875	In April, 1875.....	67
9.3, s. l....	13	144 00	100 00	28,368 00	19,700 00	July 1, 1875	In Mar., 1875. Main route; branch $50. Other branches detached.	68
28 by 10, f. nd m. c., s. . apt., 18.6 ., f. f. c., s. Louisiana, les.	12	142 00	140 00	12,780 00	12,600 00	July 1, 1875	.....	69
.6, f. f., s. l.	6	140 00	100 00	45,815 00	32,725 00	July 1, 1873	In October, 1874; ordered Dec., 1874.	70
9, f. f. and , d. l., to leborough, miles. No residue, miles.	12	140 00	100 00	9,575 00	7,105 00	July 1, 1873	Corrected returns. $930 m. m.; ordered Jan., 1875.	71
7, f. f. and s. l.	6	135 00	125 00	31,860 00	29,500 00	July 1, 1875	Main route; branches $50. (245, 257.)	72
7, f. f., s. l.	35	133 00	90 00	3,339 00	2,457 50	Oct. 1, 1874	In Oct. 1874. $612.50 m. m.	73
7, f. f., s. l.	12	132 00	75 00	17,879 40	10,158 75	July 1, 1875	Part: residue $70, (148.)	74
f. f., s. l..	12	131 00	87 50	5,960 50	3,981 25	July 1, 1875	Main route; branch $50.	75
; no r. a..	20¼*	130 00	200 00	5,720 00	8,800 00	July 1, 1873	Returns corrected; ordered Dec., 1874.	76
7.10, s. l...	7	130 00	.....	.....	.....	Feb. 16, 1874	New; ordered Feb., 1875. Pay on 17 miles fixed at $50 from Oct. 1, 1873, to Feb. 15, 1874.	77
s. l.....	7	130 00	.....	.....	.....	Jan. 15, 1874	New; ordered April, 1875. Branch, part; res. $80. Weight in Dec., 1874.	78
s. l.....	6	125 00	115 00	1,627 50	1,485 80	July 1, 1874	0.1 mile increase; 90 days, from Nov. 2, 1874. Part; residue $157, (54.) Ordered June, 1875.	79
7, f. f., s. l.	27*	125 00	100 00	2,100 00	1,800 00	Oct. 1, 1874	In Oct., 1874; $600 for mail-messenger.	80
f. f. c., s. l.	7	125 00	50 00	29,500 00	11,800 00	Jan. 19, 1874	In Dec., 1874. Ordered March, 1875. Parts consolidated.	81
(average,) . l.	9½*	125 00	107 00	40,890 00	35,001 84	July 1, 1875	.....	82
f. f., s. l..	14¼*	119 00	100 00	8,544 20	7,180 00	July 1, 1875	.....	83
f. f., d. l..	14*	118 00	95 00	7,316 00	5,890 00	April 1, 1875	In Feb., 1875. Main route; branch $50.	84
6, f. f., s. l	6	115 00	140 00	37,633 75	45,815 00	July 1, 1875	.....	85
).6, f. f., s. l.	15*	115 00	105 00	21,812 05	19,915 35	July 1, 1875	.....	86
0, f. f. c., s. l	9¼*	113 00	110 00	4,587 80	4,466 00	July 1, 1875	Part	87
1.5, f. f., s. l.	7	110 00	150 00	9,530 00	12,850 00	July 1, 1875	$400 side supply.....	88
3, f. f., s. l..	12	106 00	77 25	12,932 00	9,424 50	July 1, 1875	Part of 26004; residue $80. (121.)	89
f. f., s. l...	12	106 00	85 00	8,056 00	6,460 00	July 1, 1875	Main route; branch $50.	90
8.2, 9.4 by f., s. l.	7	105 00	100 00	14,070 00	13,400 00	July 1, 1875	In April, 1875.....	91

F.—*Table showing the re-adjustment of the rates of pay per mile on railroad-routes.*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails whole distance per day.	Miles per hour.
						Miles.	*Pounds.*	
92	Ga....	6003	15003	Atlanta, West Point	Atlanta and West Point.....	86.29	1,142	25
93	Ala...	6601	17001	Montgomery, West Point.	Western, of Alabama.....	88.5	1,125	15
94	Ga....	6017	15001	Atlanta, Charlotte...	Atlanta and Richmond Air-Line	266.50	1,115	20
95	Ill....	23016	23016	Bureau Junction, Peoria.	Chicago, Rock Island and Pacific.	47	1,055	22
96	Oreg..	44001	.....	Portland, Roseburgh	Oregon and California.....	198.81	1,038	18
97	Kans.	14002	33002	Atchison, Waterville	Central Branch Union Pacific.	100	997	20
98	N. J..	2105	.....	Bordentown, Trenton	Pennsylvania.....	7	979	22.8
99	Kans.	14005	33005	Kansas City, Baxter Springs.	Missouri River, Fort Scott and Gulf.	160.2	930	20
100	Mich.	24015	24015	Monroe, Ludington...	Flint and Pere Marquette.....	254.29	924	21
101	Minn.	26009	26009	Minneapolis, North McGregor.	Chicago, Milwaukee and Saint Paul.	215.70	1.038	20
102	Mich.	24031	24031	Fort Howard, Ishpeming.	Chicago and Northwestern....	181.20	910	20
103	Tex...	8506	31009	Shreveport, Dallas...	Texas and Pacific.....	189.2	865	18
104	Fla...	6402	.....	Jacksonville, Chattahoochee.	Jacksonville, Pensacola and Mobile.	215.75	862	15
105	N. J..	2105	.....	Camden, Monmouth Junction.	Pennsylvania.....	53.56	839	22
106	Mich.	24004	24004	White Pigeon, Grand Rapids.	Lake Shore and Michigan Southern.	95.67	820	25
107	Mich.	24007	24007	Detroit, Port Huron..	Grand Trunk.....	64.50	813	26
108	Mich.	24010	24010	Jackson, Grand Rapids	Michigan Central.....	94.86	803	22
109	Minn.	26006	26007	Saint Paul, Du Luth..	Lake Superior and Mississippi	155.73	782	22
110	N. J..	2103	.....	Frankford Junction, Kensington.	Pennsylvania.....	2.95	770	15
111	Mich..	12956	24035	Toledo, Detroit.....	Toledo, Canada Southern and Detroit.	56.37	732	25
112	Ill....	23041	23041	Quincy, Louisiana....	Quincy, Alton and Saint Louis	43	884	20
113	Iowa..	27001	27001	Burlington, Plymouth	Burlington, Cedar Rapids and Minnesota.	228	826	25
114	Iowa..	27017	27017	Wilton Junction, Leavenworth City.	Chicago, Rock Island and Pacific.	322.77	716	24
115	Mich..	24013	24013	Detroit, Bay City	Detroit and Bay City	108.97	703	25
116	Kans.	14211	33008	Kansas City, Ottawa.	Leavenworth, Lawrence and Galveston.	33.3	698	20
117	Tex...	8504	31002	Harrisburgh, Luling..	Galveston, Harrisburgh and San Antonio.	155.2	697	14
118	W. Va.	4101	.....	Harper's Ferry, Staunton.	Baltimore and Ohio.....	128.72	679	25
119	Mich.	24021	24021	New Buffalo, Pent Water.	Chicago and Michigan Lake Shore.	170.56	657	25
120	Ohio..	9019	.....	Blanchester, Hillsborough.	Marietta and Cincinnati	21	628	20
121	Minn.	26004	26018	Saint James, Le Mars.	Sioux City and Saint Paul	123	697	20

in States in which the contract term expired June 30, 1875, &c.—Continued.

Size, &c., of mail car or apartment.	Trips per week.	Pay per mile per annum.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of re-adjustment or adjustment.	Remarks.	Order.
Feet and inches.		*Dolls*	*Dolls.*	*Dolls.*	*Dolls.*			
18.6 by 8.9, fixtures, s. l.	7	105 00	125 00	9,060 45	10,781 25	July 1, 1875	In Oct., 1873. 0.4 mile increase. Under contract to June 30, 1875.	92
18.4 by 8.8, f. f., s. l	7	105 00	125 00	9,292 50	11,062 50	July 1, 1875	In Oct., 1873. Under contract to June 30, 1875.	93
20 by 9, fixtures, s. l	7	100 00	70 00	26,650 00	18,655 00	April 1, 1875	In April, 1875.....	94
24 by 10, f. f. c., s. l	12	100 00	90 00	4,700 00	4,230 00	July 1, 1875	.....	95
9.9 by 6.6½, f. f., s. l	6	100 00	.....	.....	.....	July 1, 1874	In Nov., 1874. New. Ordered Feb., 1875.	96
18 by 8.9, f. f., s. l..	7	100 00	75 00	10,000 00	7,500 00	July 1, 1874	In May, 1874. Ordered Oct., 1874.	97
8 by 6.6, s. l.... ...	12	98 00	50 00	686 00	350 00	July 1, 1875	90 days, from Oct. 1, 1874. Branch; main route $90, (105.)	98
23 by 8.6, f. f. c., s. l	13½*	96 00	100 00	15,379 20	16,400 00	July 1, 1873	In Oct., 1874. 3.8 miles decrease. Ordered Dec., 1874.	99
21 by 8.10½, f. f., s. l	14½*	96 00	.....	.....	.....	Feb. 1, 1875	New; ordered July, 1875. Main route; branches $60, $40, $40, (178, 280, 296.)	100
27 by 10.3, s. l.....	6	95 00	90 00	20,491 50	19,413 00	July 1, 1875	.....	101
11.2 by 7, 16 by 7.3, 12 by 6.6, f. f., s. l.	7	90 00	85 00	16,308 00	15,402 00	July 1, 1875	.....	102
14.1 by 7.9, f. f....	7½*	90 00	80 00	17,028 00	15,136 00	July 1, 1875	In March, 1875.....	103
16 by 9, 12 by 7, f. f., s. l.	7	90 00	75 00	19,417 50	16,181 25	April 1, 1874	In March, 1874. Main route; branch $30. Ordered Nov., 1874.	104
8 by 6.6, d. l. to Bordentown, 27 m.; s. l. residue, 26.56 miles.	10½*	90 00	60 00	4,820 40	3,213 60	July 1, 1875	90 days, from Oct. 1, 1874. Main route; branches $98, $50, (98, 266.)	105
16.5 by 9, f. f, s. l..	9*	90 00	75 00	8,610 30	6,880 75	July 1, 1875	58.90 miles formerly at $70.	106
22.5 by 7.7, f. f., s. l	15*	90 00	83 00	5,805 00	5,353 50	July 1, 1875	.....	107
10.7½ by 8.6, f.f., s.l	12	90 00	75 00	8,537 40	7,114 50	July 1, 1875	.....	108
22 by 9, f. f., s. l....	12	89 00	75 00	13,859 97	11,700 00	July 1, 1875	Trips: 12 in summer, 6 in winter. 0.27 mile decrease.	109
15.6 by 6.5½, f. f., s. l	24	88 00	.....	.....	.....	April 1, 1875	90 days, from Nov. 2, 1874. New. Branch; main route $628, (1.)	110
16 by 9.2, f. f., s. l..	12	86 00	.....	.....	.....	Jan. 16, 1874	In Aug., 1874. New; ordered Apr., 1875.	111
15.6 by 8.10, f. f., s. l	6	85 00	80 00	3,655 00	3,440 00	July 1, 1874	Ordered June, 1875..	112
12 by 9.6, f. f., s. l..	6	85 00	75 00	19,380 00	17,100 00	July 1, 1875	.....	113
22 by 10, f. f., s. l ..	10*	85 00	60 00	27,435 45	19,366 20	July 1, 1875	.....	114
14 by 7.6, f. f., s. l..	12	85 00	68 00	9,262 45	7,409 96	July 1, 1875	.....	115
23 by 8.6, f. f., s. l..	6	84 00	100 00	2,797 20	3,200 00	July 1, 1873	In Oct., 1874. Pay from Olathe. 1.3 miles increase. Ordered Dec., 1874.	116
12 by 7, f. f., s. l...	12	84 00	100 00	13,036 80	14,380 80	July 1, 1875	71.2 miles formerly at $84.	117
17 by 8.7½, f. f., s. l.	6	83 00	50 00	10,683 76	6,414 50	July 1, 1873	In August, 1874. Weight for 113 miles. Ordered Oct., 1874. 0.43 mile increase.	118
12 by 9, f. f., s. l...	14½*	82 00	86 00	13,985 92	14,668 16	July 1, 1875	Main route; branch $68. (157.)	119
17 by 9.6, f. f. In charge of baggage-master.	12	81 00	50 00	1,701 00	1,050 00	July 1, 1873	In Aug., 1874. Ordered Oct., 1874.	120
22 by 9.3, f. f., s. l.	6	80 00	77 25	9,840 00	9,501 75	July 1, 1875	Detached from 26004, old No., $106, (89.)	121

F.—*Table showing the re-adjustment of the rates of pay per mile on railroad-routes*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails whole distance per day.	Miles per hour.
						Miles.	*Pounds.*	
122	Mo ...	28007	28007	Moberly, Ottumwa ...	Saint Louis, Kansas City and Northern.	131	648	22
123	Dak ..	35001	.....	Sioux City, Yankton	Dakota Southern	61.48	643	20
124	Mich .	24002	24002	Monroe, Adrian	Lake Shore and Michigan Southern.	35.23	634	25
125	Wis ..	25013	25024	Racine, Rock Island Junction.	Western Union	189.40	629	22
126	Wis ..	25003	25003	Milwaukee, Berlin ...	Chicago, Milwaukee and Saint Paul.	94.80	617	20
127	Ga....	6009	15010	Savannah, Macon	Central Railroad and Banking, of Georgia.	198½	604	21
128	Kans	14003	33003	Lawrence, Coffeyville	Leavenworth, Lawrence and Galveston.	142.9	589	20
129	Ga....	6004	15005	Millen, Augusta.....	Central Railroad and Banking, of Georgia.	53½	583	17½
130	Mich..	24018	24018	Fort Wayne, Walton.	Grand Rapids and Indiana....	260.55	566	20
131	Mich..	24017	24017	Detroit, Howard City.	Detroit, Lansing and Lake Michigan.	164.67	561	22
132	Pa ...	2430	.....	Harrisburgh, Hagerstown.	Cumberland Valley	74	545	24
133	Pa ...	2430	.....	Hagerstown, Martinsburgh.	.....do	20	545	24
134	Iowa..	27019	27019	Keokuk, Des Moines.	Keokuk and Des Moines.....	162	523	20
135	Ill....	23037	23037	Vincennes, Cairo.....	Cairo and Vincennes.....	158	571	25
136	Mo ...	10517*a*	.....	Pleasant Hill, Lawrence.	Saint Louis, Lawrence and Western.	62	566	18
137	Mass .	746	.....	Taunton, Attleborough	New Bedford, (operating Boston, Clinton, and Fitchburgh.)	16.67	559	28
138	Wis ..	25011	25011	Kenosha, Rockford...	Chicago and Northwestern....	73.60	553	15
139	Tex ..	8577*a*	.....	Bremond, Waco.....	Houston and Texas Central, (operating Waco and Northwestern.)	44.56	548	20
140	Ohio..	9042	.....	Newark, Shawnee....	Newark, Somerset and Straitsville.	44.04	537	25
141	Mo ...	28018	28018	Keokuk, Hannibal ...	Mississippi Valley and Western.	60 72	527	20
142	Ill	23042	23042	Chicago, Danville	Chicago, Danville and Vincennes.	108	518	22
143	Mo .. / Kans	10517*a* / 28016	14311 / 33011	Pleasant Hill, Carbondale.	Saint Louis, Lawrence and Western.	94	512	18
144	Wis ..	25018	25018	Milwaukee, Two Rivers.	Milwaukee, Lake Shore and Western.	85	501	20
145	Iowa .	27022	27022	Waterloo, Mona.....	Illinois Central.....	80	487	12
146	Minn .	26002	26003	Saint Paul, Sauk Rapids.	Saint Paul and Pacific	78	484	18
147	Mass .	738	657	Winchendon, Peterborough.	Boston, Barre and Gardner, (late Monadnock.)	16.37	464	24
148	Wis ..	25010	25010	Elroy, Winona Junction.	Chicago and Northwestern ...	54.90	497	20
149	Mo ...	28006	28028	Saint Joseph, Hopkins	Kansas City, Saint Joseph and Council Bluffs.	61.5	476	24
150	Ill	23033	23033	Beardstown, Shawneetown.	Springfield and Illinois Southeastern.	229.70	461	16
151	Ill	23027	23027	State Line, Warsaw..	Toledo, Peoria and Warsaw ..	228.75	457	20

States in which the contract term expired June 30, 1875, *&c.*—Continued.

e, &c., of mail ar or apart- nent.	Trips per week.	Pay per mile per annum.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of re-adjustment or adjustment.	Remarks.	Order.
eet and inches.		*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*			
by 7.6, f. f., s. l..	6	80 00	75 00	10, 480 00	9, 825 00	July 1, 1875	.....	122
3 by 9, f. f., s. l..	6	80 00	63 00	4, 918 40	3, 873 24	April 1, 1875	In March, 1875.....	123
5 by 8.9¼, f. f., s. l	12	80 00	75 00	2, 818 40	2, 642 25	July 1, 1875	.....	124
by 9, f. f., s. l...	12	80 00	70 00	15, 152 00	13, 258 00	July 1, 1875	.....	125
by 10, f. f., s. l ..	12	80 00	90 00	7, 584 00	8, 532 00	July 1, 1875	.....	126
by 7, f. f., s. l ..	14	80 00	110 00	15, 370 00	21, 133 75	July 1, 1875	In Oct., 1873. Under contract to June 30, 1875.	127
by 8.6, f. f., s. l..	6	79 00	100 00	11, 289 10	14, 030 00	July 1, 1873	In Oct., 1874. 2.6 miles increase. Main route; br'ch $57, (190.) Ordered Dec., 1874.	128
2 by 7, f. f., s. l ..	14	79 00	125 00	4, 196 87	6, 640 62	July 1, 1875	In Oct., 1873. Under contract to June 30, 1875.	129
.6 by 6.11, s. l...	9¼*	78 00	50 00	20, 322 90	13, 027 50	July 1, 1875	.....	130
.6 by 9, fix., s. l.	11¼*	78 00	65 00	12, 844 26	10, 703 55	July 1, 1875	.....	131
l by 8.4, f. f., s. l.	11⅛*	77 00	100 00	5, 698 00	7, 400 00	July 1, 1873	Weight in Sept., 1874. Part; see residue, (133.) Ordered Oct., 1875.	132
l by 8.4, f. f., s. l.	11⅛*	77 00	.....	.....	.....	Dec. 1, 1873	Weight in Sept., 1874. New; ordered Dec., 1875.	133
by 9, s. l.....	12	76 00	84 00	12, 312 00	13, 608 00	July 1, 1873	.....	134
by 6.6, f. f., s. l.	6	75 00	70 00	11, 850 00	11, 060 00	July 1, 1875	.....	135
.6 by 7.7, f. f., s. l	6	75 00	50 00	4, 650 00	3, 100 00	July 1, 1873	60 days in May and June, 1874. Ordered July, 1875.	136
apartment....	28	75 00	.....	.....	.....	July 1, 1874	New; ordered Jan., 1875.	137
y 9, f. f., s. l....	6	75 00	.....	.....	.....	July 1, 1874	New; ordered July, 1875.	138
by 7, f. f., s. l...	6	75 00	65 00	3, 342 00	2, 896 40	July 1, 1873	In Jan., 1875. Ordered Mar., 1875.	139
by 9, f. f., s. l...	6	75 00	40 00	3, 303 37	1, 761 80	July 1, 1873	In Aug., 1874. Ordered Jan., 1875.	140
by 7, f. f., s. l...	6	75 00	.....	.....	.....	Mar. 1, 1875	New.....	141
by 6. 8, f. f., s, l.	12	75 00	54 00	8, 100 00	5, 832 00	July 1, 1875	Main route; branch $40.	142
3 by 7.7, f. f., s.l.	6	75 00	50 00	7, 050 00	5, 074 00	Oct. 1, 1874	60 days in May and June, 1874. Consolidated from Oct. 1, 1874. 0.9 m. decrease; 32.9 m. formerly at $60.	143
y 7.10, f. f., s. l.	12	75 00	67 00	6, 375 00	5, 695 00	July 1, 1875	Main route; branch $45, (273.)	144
l by 8.11, 17.10 y 9, f. f., s. l.	12	73 00	63 00	5, 840 00	5, 040 00	July 1, 1875	.....	145
3 by 9, f. f., s. l.	9¼*	73 00	68 00	5, 694 00	5, 304 00	July 1, 1875	.....	146
y —, fixtures, l.	12	72 00	50 00	1, 178 64	800 00	Jan. 1, 1875	In Nov., 1874. 0.37 mile increase.	147
y 9.6, f. f., s. l .	6	70 00	.....	.....	.....	Jan. 10, 1874	New: ordered July, 1875. Part; residue $132, (74.)	148
l by 7.5, f. f. c., . l.	6	70 00	60 00	4, 305 00	3, 690 00	July 1, 1875	Formerly branch of 28006.	149
y 11, s. l.....	6	70 00	75 00	16, 079 00	17, 227 50	July 1, 1875	.....	150
y 8.9, f. f., s. l..	6	70 00	64 00	16, 612 50	15, 240 00	July 1, 1875	$600 for ferriage, main route; branch $50.	151

F.—*Table showing the re-adjustment of the rates of pay per mile on railro*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails whole distance per day.	[illegible]
						Miles.	*Pounds.*	
152	Minn.	26005	26001	DuLuth, Fargo	Northern Pacific	229	450	2
153	Minn.	26016	26016	La Crosse, Winnebago City.	Southern Minnesota	170.50	451	18
154	Wis.	25016	25016	Milwaukee, Green Bay	Wisconsin Central, (operated by Phillips & Colby Construction Company.)	111.54	449	29
155	Wis.	25024	25013	Milwaukee, Fond-du-Lac.	Chicago and Northwestern	63.53	446	22
156	Iowa	27012	27012	Clinton, La Crescent Junction.	Chicago, Dubuque and Minnesota.	179.77	431	20
157	Mich	24021	24021	Holland, Grand Rapids.	Chicago and Michigan Lake Shore.	26.65	426	25
158	Iowa	27005	27005	Red Oak, Eastport	Burlington and Missouri River	50	425	17
159	N. J.	2126	.....	New York, Pemberton Junction.	New Jersey Southern	84.6	411	25
160	Pa.	2486	.....	Pittsburgh, Monongahela City.	Pittsburgh, Virginia and Charleston.	31.84	406	20
161	Iowa	27010	27010	Albia, Northwood	Central, of Iowa	189.2	427	20
162	Tex.	8770	.....	Sherman, Brookston	Texas and Pacific	57	438	15
163	Ill.	23008	23008	Elmwood, Buda	Chicago, Burlington and Quincy.	45	437	20
164	Mich.	24003	24003	Adrian, Jackson	Lake Shore and Michigan Southern.	47.25	402	25
165	Iowa	27007	27007	Creston, Hopkins	Burlington and Missouri River.	44.4	402	22
166	Minn.	26014	26014	Saint Peter, New Ulm	Chicago and Northwestern	30	389	20
167	Ky.	9738	.....	Elizabethtown, Paducah.	Elizabethtown and Paducah	185	376	9
168	Ky.	9738	20011	Louisville, Cecilian	Louisville, Paducah and Southwestern, (late Elizabethtown and Paducah.)	47.19	376	
169	Ill.	23005	23005	Sterling, Alton Junction.	Rockford, Rock Island and St. Louis.	270.80	370	
170	Ill.	23040	23040	Peoria, Rock Island	Peoria and Rock Island	92	371	
171	Ala.	6607	17007	Opelika, Columbus	Western, of Alabama	28	3	
172	Dak.	13929	35001	Sioux City, Yankton	Dakota Southern	61.48		
173	N. Y.	1293	.....	Ithaca, Geneva	Geneva, Ithaca and Athens	40.25		
174	Ill.	23011	23011	Burlington, Quincy	Chicago, Burlington and Quincy.	71.85		
175	Wis.	25016	25016	Hilbert, Menasha	Wisconsin Central, (operated by Phillips & Colby Construction Company.)	16		
176	N. J.	2107	.....	Camden, Atlantic City	Camden and Atlantic	69		
177	Mich.	24009	24009	Jackson, West Branch	Michigan Central	169		
178	Mich.	24015	24015	East Saginaw, Bay City.	Flint and Pere Marquette	12.		
179	Pa.	2491	.....	Pollock, Karns City	Parker and Karns City	10		
180	Pa.	2468	.....	Lewisburgh, Laurelton.	Pennsylvania, (lessees Lewisburgh Centre and Spruce Creek.)	29		
			18003	Jackson, Meridian	Vicksburgh and Meridian			

utes in States in which the contract term expired June 30, 1875, *&c.*—Continued.

ze, &c., of mail car or apartment.	Trips per week.	Pay per mile per annum.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of re-adjustment or adjustment.	Remarks.	Order.
Feet and inches.		*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*			
by 8.6, 20 by 3.8, 13 by 7.4, f. f. c., s. l.	6	70 00	63 00	16,030 00	14,427 00	July 1, 1875	Part; residue $40, (281.)	152
by 9.2, f. f., s. l	6	68 00	60 00	11,594 00	10,230 00	July 1, 1875	Speed 11½ miles per hour beyond Wells, 23 miles.	153
.7 by 7.7, f. f., s. l	6	68 00	83 00	7,584 72	9,257 82	July 1, 1875	Main route; branch $60, (175.)	154
.2½ by 7.4½, f. f., s. l.	6	68 00	.....	.....	.....	Feb. 1, 1874	New; ordered July, 1875.	155
.6 by 8.10, f. f., s. l.	8*	68 00	60 00	12,224 36	10,786 20	July 1, 1875	60 days, in Mar. and April, 1875.	156
by 9, f. f., s. l..	12	68 00	50 00	1,812 20	1,332 50	July 1, 1875	Branch; main route $82, (119.)	157
.6 by 6.9, f. f., s. l.	9*	68 00	60 00	3,400 00	3,000 00	July 1, 1875	Branch; main route $250, (18.)	158
by 6, f. f., s. l...	10½*	67 00	75 00	5,668 20	6,345 00	July 1, 1873	In Oct., 1874. Main route; branches $50. Ordered Jan., 1875.	159
by 8, fixtures, s. l.	12	67 00	50 00	2,133 28	1,592 00	Oct. 1, 1874	In July, 1875.....	160
by 9.5, f. f., s. l.	6	66 00	50 00	12,487 20	9,460 00	July 1, 1875	.....	161
.1 by 7.10, s. l..	6	65 00	.....	.....	.....	Sept. 1, 1874	In Nov., 1874. New; ordered Feb., 1875.	162
2 by 6.9, f. f., s, l.	6	65 00	60 00	2,925 00	2,700 00	July 1, 1875	Branch; main route $57, (187.)	163
.9½ by 8.8, f. f., s. l.	6	65 00	50 00	3,071 25	2,362 50	July 1, 1875	.....	164
.3 by 7.3, f. f., s. l.	6	65 00	60 00	2,886 00	2,664 00	July 1, 1875	.....	165
.5 by 9.6, f. f., s. l.	6	65 00	.....	.....	.....	May 1, 1872	New; ordered June, 1875. Part; res. $30, (300.)	166
by 9.6, 9 by 7.6, f. f., s. l.	6	64 00	85 00	11,840 00	15,725 00	July 1, 1873	In May, 1874. Ordered Nov., 1874.	167
by 9.6, 9 by 7.6, f. f., s. l.	6	64 00	.....	.....	.....	July 1, 1874	New; part. Ordered Nov., 1874.	168
.6 by 9.4, f. f., s. l.	8*	64 00	80 00	17,331 20	21,664 00	July 1, 1875	.....	169
by 7. f. f., s. l..	6	63 00	60 00	5,796 00	5,520 00	July 1, 1875	.....	170
.4 by 8.8, f. f., s l.	7	63 00	75 00	1,764 00	2,100 00	July 1, 1875	In Oct., 1873. Under contract to June 30, 1875.	171
by 9.6, f. f., s. l.	6	63 00	75 00	3,873 24	4,611 00	July 1, 1874	In Aug., 1874. Ordered Oct., 1874.	172
by 7, f. f., s. l...	6	63 00	.....	.....	.....	Dec. 20, 1873	In July, 1874. New; ordered Oct., 1874.	173
.3 by 6. 11, f. f., s. l.	6	62 00	75 00	4,454 75	5,388 75	July 1, 1875	.....	174
.7 by 7.7, f. f., s. l.	6	60 00	83 00	960 00	1,328 00	July 1, 1875	Branch; main route $68, (154.)	175
by 6, fixtures, s. l.	14*	60 00	59 00	3,600 00	3,000 00	July 1, 1873	In May, 1875. Ordered July, 1875.	176
.10 by 6, f. f., s. l., to Saginaw, 101 miles; ½ line res., 68 miles.	10¾*	60 00	50 00	10,140 00	8,450 00	July 1, 1875	Part; residue $40, (279.) 15 miles speed beyond Saginaw.	177
c.; no r. s.....	27*	60 00	.....	.....	.....	Feb. 1, 1875	Branch; main route $96, (100.) New.	178
by 5, f. f., d. l.; s. not appointed by Dept.	12	60 00	.....	.....	.....	Oct. 1, 1874	In Dec., 1874. New; ordered Feb., 1875.	179
by 6.8, f. f., d. l.	12	60 00	40 00	1,350·80	535 00	July 1, 1874	In April, 1875. $107 m. m. 10.3 miles inc. Ordered July, 1875.	180
6 by 7.1, f. f., s. l.	6	59 00	75 00	5,616 80	7,140 00	July 1, 1875	Part; residue $100. In Oct., 1873. Under contr. to June 30, 1875.	181

F.—*Table showing the re-adjustment of the rates of pay per mile on railroad routes*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails whole distance per day.	Miles per hour.
						Miles.	*Pounds.*	
182	Mich..	24028	24028	Jonesville, Lansing ..	Lake Shore and Michigan Southern.	60.87	314	22
183	Ill	23007	23007	Galva, Keithsburgh..	Chicago, Burling'n and Quincy	59.30	304	20
184	Mo ...	28019	28019	Quincy, Kirksville ...	Quincy, Missouri and Pacific	71.28	303	20
185	Mo ...	28016	28016	Pleasant Hill, Carbondale.	Saint Louis, Lawrence and Western.	94	298	12
186	Wis...	25004	25004	Milton Junction, Monroe.	Chicago, Milwaukee and Saint Paul.	42.80	297	15
187	Ill	23008	23008	Rushville, Yates City	Chicago, Burling'n and Quincy	63.75	292	19
188	Iowa..	27025	27025	Calmar, Algona	Chicago, Milwaukee and Saint Paul.	127.8	291	15
189	Mass..	658	741	Palmer, Athol Depot	Springfield, Athol and Northeastern, (late Athol and Enfield.)	35.34	291	20
190	Kans..	14003	33003	Cherryvale, Independence.	Leavenworth, Lawrence and Galveston.	10	290	20
191	Mich..	24038	24038	Walton, Petoskey	Grand Rapids and Indiana....	71.86	286	20
192	Nebr..	34005	.....	Brownsville, Nebraska City.	Midland Pacific.....	24.75	286	15
193	Nebr..	34005	.....	Nebraska City, Seward.	.....do	84.1	286	15
194	Mo ...	10508	28008	Tipton, Boonville.....	Atlantic and Pacific	25	281	20
195	Minn..	26001	26002	Saint Paul, Breckinridge.	Saint Paul and Pacific	219.25	275	18
196	Ala...	6609	.....	Selma, York Station..	Alabama Central	81.70	273	16
197	Iowa..	27015	27015	Des Moines, Indianola	Chicago, Rock Island and Pacific.	21.4	285	17
198	N. C ..	5003	13003	Wilmington, Monroe.	Carolina Central	164	268	20
199	N. J ..	2103	.....	Princeton Junction, Princeton.	Pennsylvania.....	3	265	12
200	Pa....	2441	.....	Washington, Wheeling.	Hempfield	32	260	20
201	Ala...	6602	17002	Montgomery, Selma..	Western, of Alabama.....	50	257	15
202	Minn..	26003	26004	East Saint Cloud Station, Melrose.	Saint Paul and Pacific	35	256	12
203	Ga....	6145	15021	Camac, Macon.....	Macon and Augusta	79	255	20
204	Ill	23052	23052	Courtland Station, Sycamore.	Sycamore and Courtland.....	5	251	25
205	Md ...	3506	.....	Weaverton, Hagerstown.	Baltimore and Ohio.....	24.25	244	25
206	Iowa..	27031	27031	Des Moines, Ft. Dodge	Des Moines and Fort Dodge ..	89.04	241	20
207	Va....	4404	11004	Alexand'a, Round Hill	Washington and Ohio.....	52.74	241	23
208	Mich..	24025	24025	Jackson, Niles	Michigan Central.....	104.57	235	26
	Wis...	25015	25015	Green Bay, Winona...	Green Bay and Minnesota, (late Green Bay and Lake Pepin.)	216.41	233	20

s in which the contract term expired June 30, 1875, *&c.*—Continued.

, of mail r apart-	Trips per week.	Pay per mile per annum.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of re-adjustment or adjustment.	Remarks.	Order.
d inches.		*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*			
f., a. l...	6	58 00	50 00	3,530 46	3,043 50	July 1, 1875	.....	182
3.10, f. f.,	6	58 00	50 00	3,439 40	2,965 00	July 1, 1875	Branch; main route $328, (9.)	183
f. f., a. l..	12	58 00	60 00	4,134 24	4,276 80	July 1, 1875	.....	184
10 by 8, f.	6	58 00	75 00	5,452 00	7,050 00	July 1, 1875	.....	185
3, a. l....	6	58 00	50 00	2,482 40	2,140 00	July 1, 1875	.....	186
10, f. f. c. c., s. l.; a. in b. c. wistown, es.	8¾*	57 00	60 00	3,633 75	3,825 00	July 1, 1875	Main route; branch $65, (163.)	187
f. f., a. l..	6	57 00	50 00	7,284 60	6,390 00	July 1, 1875	.....	188
, f. f., a. l.	6	57 00	50 00	2,164 38	1,917 00	July 1, 1873	$150 for mail mess'r service. Ordered Nov., 1874.	189
.....	6	57 00	50 00	570 00	500 00	July 1, 1873	In Oct., 1874. Br'ch; main r'te $79, (128.) Ordered Dec., 1874.	190
11, a. l...	7	57 00	.....	.....	.....	July 1, 1874	New; ordered July, 1875.	191
f. f., a. l..	9¼*	57 00	.....	.....	.....	April 1, 1875	Part, new; residue $57, (193.)	192
f. f., a. l..	9¼*	57 00	50 00	4,793 70	4,205 00	April 1, 1875	Part; residue new, $57, (192.)	193
, f. f.; no	12	56 00	50 00	1,400 00	1,250 00	July 1, 1873	In Oct., 1874. Ordered Dec., 1874.	194
, f. f., a. l.	8*	56 00	50 00	12,278 00	10,962 50	July 1, 1875	.....	195
f. f.....	7	56 00	75 00	4,575 20	6,127 50	July 1, 1873	In Oct., 1874. Ordered Mar., 1875.	196
c	6	55 00	50 00	1,177 00	1,070 00	July 1, 1875	Main route; branch $50.	197
, f. f., a. l.	6	55 00	50 00	9,020 00	8,200 00	July 1, 1873	In Oct., 1874. Pay fixed on 141 miles from July 1, 1873; on 17¼ miles from Oct. 1, 1874; and on 5¾ miles from Nov. 12, 1874. Ordered Jan., 1875.	198
; no r. a..	12	55 00	.....	.....	.....	April 1, 1875	90 days, from Nov. 2, 1874. Branch; main r'te $628, (1.) New.	199
½, f. f., a. l	12	55 00	50 00	2,137 00	1,977 00	July 1, 1873	In Oct., 1874. $377 side service. Ordered Dec., 1874.	200
.8, f. f., a. l.	7	54 00	50 00	2,700 00	2,500 00	July 1, 1875	In Oct., 1873. Under contract to June 30, 1875.	201
, f. f., a. l..	6¼*	54 00	50 00	1,890 00	1,750 00	July 1, 1875	.....	202
5.8, furni- l.	6	54 00	50 00	4,266 00	3,950 00	July 1, 1873	In Oct., 1874. Ordered April, 1875.	203
9, in pas- -car. No	12½*	54 00	50 00	420 00	400 00	July 1, 1875	$159 mail messenger.	204
½, f. f., d. remark.)	12	53 00	50 00	1,285 25	1,212 50	July 1, 1873	In Oct., 1874. 2d line in apartment used jointly by baggage-master and route-agent. Ordered Dec., 1874.	205
ic feet, f.	6	53 00	75 00	4,719 12	6,577 50	July 1, 1874	For'ly part of 11001. 1.34 miles increase.	206
f. f., a. l...	6	53 00	50 00	2,795 22	2,637 00	July 1, 1875	In May, 1875	207
.2, 10.8 by f., a. l.	6	52 00	50 00	5,437 64	5,228 50	July 1, 1875	.....	208
7.6¼, f. f.,	6	52 00	50 00	11,253 32	10,820 50	July 1, 1875	.....	209

F.—*Table showing the re-adjustment of the rates of pay per mile on railroad routes*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails whole distance per day.	Miles per hour.
						Miles.	*Pounds.*	
210	Iowa..	27020	27020	Farley, Cedar Rapids.	Dubuque Southwestern.....	55.37	228	13
211	Va....	4405	11003	Manassas, Strasburgh	Washington City, Virginia Midland and Great Southern.	62.55	216	20
212	La....	8005	30008	Vicksburgh, Monroe..	North Louisiana and Texas...	75.50	227	15
213	Iowa..	27002	27002	Cedar Rapids, Postville.	Burlington, Cedar Rapids and Minnesota.	99.8	221	16
214	Iowa..	27027	27027	Davenport, Delaware Centre.	Davenport and Saint Paul	90	217	16
215	Iowa..	27027	27027	Delaware Centre, Fayette.	.....do	39.33	217	16
216	Mo ...	28012	28012	Saint Joseph, Lexington.	Saint Louis, Kansas City and Northern, (late Saint Louis and Saint Joseph.)	76.75	215	25
217	Tex...	8770	31011	Sherman, Brookston..	Texas and Pacific, (Trans-Continental Division.)	57	215	11
218	Mo ...	28008	28008	Tipton, Boonville.....	Atlantic and Pacific	25	214	20
219	Mich..	24034	24034	Walton, Traverse City	Continental Improvement Co.	26.26	209	20
220	Mich..	24024	24024	Ypsilanti, Bankers ...	Detroit, Hillsdale and Indiana.	65.54	196	16
221	Minn..	26012	26012	Austin, Mason City ..	Chicago, Milwaukee and Saint Paul.	41.38	195	20
222	Ill	23055	23055	Decatur, Montezuma.	Indiana and Illinois Central ..	87	188	21¼
223	Iowa..	27008	27008	Viele Junction, Unionville.	Burlington and Southwestern.	104.75	188	18
224	Pa ...	2480	.....	Red Bank Furnace, Driftwood.	Allegheny Valley.....	109.95	184	19
225	Iowa..	27024	27024	Clinton, Anamosa	Iowa Midland.....	74.1	183	20
226	Tex ..	8666	31007	Palestine, Rockdale ..	International & Great Northern.	121	182	10
227	Ohio ..	9044	.....	Marietta, Canal Dover	Marietta, Pittsburgh & Cleveland.	99.96	178	20
228	Mo ...	28005	28005	Palmyra, Hannibal ...	Hannibal and Saint Joseph ...	15	177	20
229	Va....	4782	11016	Lynchburgh, Danville	Washington City, Virginia Midland & Great Southern.	67.28	174	30
230	Pa ...	2486	.....	Pittsburgh, Monongahela City.	Pittsburgh, Virginia and Charleston.	31.84	168	20
231	Wis ..	25005	25005	Watertown, Madison .	Chicago, Milwaukee and Saint Paul.	38.45	166	15
232	Ill ...	11923	23053	East Saint Louis, Murphysborough.	Cairo and Saint Louis.....	91	161	19
233	Mo ...	10525a	28025	Salisbury, Glasgow...	Keokuk and Kansas City	15.66	160	15
234	Wis ..	25017	25017	Menasha, Worcester..	Wisconsin Central, (operated by Phillips & Colby Construction Company.)	164.10	157	18
235	Mich .	24033	24033	Ionia, Stanton.....	Detroit, Lansing and Lake Michigan.	25.31	156	25
236	Me ...	231	.....	West Waterville, Madison.	Somerset	20.61	154	20
237	Ala...	6616	17016	Opelika, Alexander City.	Savannah and Memphis.....	47.28	153	20
238	Iowa..	27030	27030	Des Moines, Ames ...	Des Moines and Minnesota....	37.12	152	18
239	Mass .	747	.....	Cohasset, South Duxbury.	Duxbury and Cohasset.....	18.36	152	19
240	Ill	23014	23014	Rock Falls, Cornton..	Chicago, Burlington & Quincy.	47.23	145	11
241	R. I...	823	.....	Providence, Pascoag..	Providence and Springfield ...	23.12	143	20
242	Iowa..	27016	27016	Washington, Sigourney	Chicago, Rock Island & Pacific.	29	141	20
243	Iowa..	27003	27003	Cedar Rapids, Traer..	Burlington, Cedar Rapids and Minnesota.	24.77	140	15
244	Mo ...	28009	28009	Centralia, Columbia ..	Saint Louis, Kansas City and Northern.	22	139	22

in which the contract term expired June 30, 1875, *&c.*—Continued.

of mail apart-	Trips per week.	Pay per mile per annum.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of re-adjustment or adjustment.	Remarks.	Order.
inches.		*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*			
f. f., s. l.	6	52 00	50 00	2,879 24	2,768 50	July 1, 1875	.....	210
9, f. f., s. l	6	51 00	60 00	3,190 05	3,600 00	July 1, 1875	In Oct., 1873. 2.55 miles increase. Under contract to June 30, 1875.	211
, f. f., s. l.	7	51 00	75 00	4,350 50	6,162 50	July 1, 1875	$500 for ferriage and mail-mess'r service.	212
3, f. f., s. l	6	51 00	50 00	5,089 80	4,990 00	July 1, 1875	.....	213
10.3 by s. l.	6	51 00	50 00	4,590 00	4,500 00	July 1, 1874	Part; residue new, $51, (215.)	214
10.3 by s. l.	6	51 00	.....	.....	.....	July 1, 1874	New, part; residue $51, (214.) Ordered July, 1875.	215
f. f., s. l.	7	51 00	50 00	3,914 25	3,837 50	July 1, 1875	.....	216
), f. f., s. l.	6	51 00	65 00	2,907 00	3,705 00	July 1, 1875	In March, 1875	217
f. f. No	12	51 00	56 00	1,275 00	1,400 00	July 1, 1875	In April, 1875	218
.11. No	6	50 00	55 00	1,313 00	1,444 30	July 1, 1875	.....	219
, f. f., s. l.	6	50 00	45 00	3,277 00	2,949 30	July 1, 1875	.....	220
f. f., s. l.	6, 12	50 00	40 00	2,069 00	1,655 20	July 1, 1874	Ordered July, 1875. Trips, 6 in March, 12 in June, 1875.	221
7.2, f. f.,	6	50 00	.....	.....	.....	Dec. 16, 1873	New; ordered May, 1875.	222
7.7, fix- s. l.	6	50 00	52 00	5,237 50	5,447 00	July 1, 1875	.....	223
f. f., s. l.	6	50 00	.....	.....	.....	Aug. 15, 1874	In Mar., 1875. New; ordered May, 1875.	224
, f. f., s. l.	6	50 00	40 00	3,705 00	2,964 00	July 1, 1875	.....	225
f., s. l ...	6	50 00	.....	.....	.....	Oct. 1, 1874	New; ordered July, 1875.	226
9, f. f., s. l.	6	50 00	40 00	4,998 00	3,998 40	Oct. 15, 1873	In March, 1875. Ordered April, 1875.	227
r. a.....	13	50 00	75 00	750 00	1,125 00	July 1, 1875	Branch; main route $240, $215, (19.)	228
7.9, fix- s. l.	6	50 00	.....	.....	.....	July 10, 1874	In May, 1875. New; ordered July, 1875.	229
f., s. l...	9*	50 00	.....	.....	.....	Mar. 2, 1874	In Nov., 1874. New; ordered Dec., 1874.	230
, f. f., s. l.	6	50 00	100 00	1,922 50	3,845 00	July 1, 1874	In Mar., 1875. Ordered Sept., 1874.	231
f. f., s. l..	6	50 00	.....	.....	.....	Oct. 1, 1873	In Sept., 1874. New; ordered Dec., 1874.	232
; no r. a.	12	50 00	40 00	783 00	626 40	Jan. 1, 1875	In Dec., 1874	233
7, f. f., s. l.	6	50 00	70 00	8,205 00	8,023 10	July 1, 1875	48.93 miles formerly at $40; 49.90 miles at $30.	234
fixtures,	6	50 00	40 00	1,265 50	1,012 40	July 1, 1875	.....	235
3, f. f., s. l.	6	50 00	.....	.....	.....	Mar. 1, 1875	In April, 1875. Pay fixed on 13.31 miles from May 16, 1874. New; ordered in July, 1875.	236
f., s. l....	6	50 00	40 00	2,364 00	1,891 20	Oct. 1, 1874	In October, 1874.....	237
, f. f.; no	6	50 00	.....	.....	.....	Aug. 15, 1874	In Mar., 1875. New; ordered Aug., 1875.	238
r. a.....	12	50 00	.....	.....	.....	July 16, 1874	New; ordered Jan., 1875.	239
0, f. f., s. l	6	50 00	40 00	2,361 50	1,889 20	July 1, 1875	.....	240
no r. a...	12	50 00	.....	.....	.....	Oct. 16, 1873	In Mar., 1875. New; ordered Apr., 1875	241
f. f., s. l..	6	50 00	40 00	1,450 00	1,160 00	July 1, 1875	.....	242
8, f. f., s. l	6	50 00	40 00	1,238 50	990 80	July 1, 1875	.....	243
no r. a...	6	50 00	54 00	1,100 00	1,188 00	July 1, 1875	.....	244

F.—*Table showing the re-adjustment of the rates of pay per mile on railroad routes*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails whole distance per day.	Miles per hour.
						Miles.	*Pounds.*	
245	Tex...	8683	31006	Mineola, Zavala	International & Great Northern.	44¼	134	10
246	N. C..	5002	13002	Rocky Mount, Tarborough.	Wilmington and Weldon.....	17	134	15
247	Mich .	24037	24037	Saint Clair City, Richmond.	Michigan Midland and Canada	16.74	134	20
248	Mo ...	28002	28027	Cairo, Poplar Bluffs..	Saint Louis, Iron Mountain and Southern, (late Saint Louis and Iron Mountain and Cairo and Fulton.)	73.73	124	15½
249	Mo ...	28013	28013	Brunswick, Pattonsburgh.	Brunswick and Chillicothe & Saint Louis Council Bluffs and Omaha.	80.05	117	15
250	Tenn .	10003	19003	Rogersville, Bull's Gap.	Rogersville and Jefferson, W. P. Elliott, owner.	15	113	15
251	Iowa..	27028	27028	Sabula, Marion.....	Chicago, Milwaukee and Saint Paul.	87.75	109	18
252	Iowa..	27004	27004	Muscatine, Riverside	Burlington, Cedar Rapids and Minnesota.	32.23	109	16
253	Iowa..	27018	27018	Davenport, Maquoketa	Davenport and Saint Paul	42.76	104	16
254	Ill	23004	23004	Elgin, Geneva	Chicago and Northwestern....	44	102	22
255	Mo ...	10524*a*	28023	Cuba, Salem.....	Saint Louis, Salem and Little Rock.	40.88	101	10
256	Ill	23044	23044	Mattoon, Hervey City	Chicago and Illinois Southern, Consolidated.	31.66	100	15
257	Tex ..	8683	31006	Phelps, Huntsville ...	International & Great Northern.	8.50	98	10
258	Mass..	742	.....	Lynn, Marblehead....	Eastern.....	6.05	84	20
259	Conn .	905	.....	Windsor Locks, Suffield.	New York, New Haven and Hartford.	4.76	83	25
260	N. Y..	1294	.....	Watertown, Sackett's Harbor.	Utica and Black River.....	12.57	79	16
261	Utah .	16651	41003	Ogden, Franklin.....	Utah Northern	80.5	78	12
262	Mich .	24030	24030	East Saginaw, Saint Louis.	Saginaw Valley & Saint Louis.	35.19	72	20
263	N. Y..	1805	.....	Thirtieth street, New York, Spuyten Duyvil.	New York Central and Hudson River.	10	68	....
264	N. H..	359	.....	Wing Road, Twin Mountain.	Boston, Concord and Montreal.	9.49	66	22½
265	Ill	23056	23056	Geneva, Batavia.....	Chicago and Northwestern....	3.50	64	15
266	N. J ..	2105	.....	Jamesburgh, South Amboy.	Pennsylvania.....	14.95	61	26.3
[illegible]	Mass .	745	.....	Newton Junction, West Amesbury.	Boston and Maine	5.05	44	20
[illegible]	[illegible]	743	.....	Wakefield, Peabody..	Eastern.....	8.54	42	23
[illegible]	..	2495	.....	Berlin, Garrett	Buffalo Valley	8.62	42	15
[illegible]	.	741	.....	Wenham, Essex.....	Eastern.....	5.55	31	20
[illegible]	...	[illegible]	[illegible]	Carbondale, Grand Tower.	Grand Tower Mining. Manufact'g & Transportat'n Co.	25	104	18
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]epeuskun, Winneconne.	Chicago, Milwaukee and Saint Paul.	16.25	96	20
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]anitowoc, Milwaukee.	Milwaukee, Lake Shore and Western.	44.50	90	15
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]pringfield, Havana..	Springfield and Northwestern.	48.20	87	19

tes in which the contract term expired June 30, 1875, *&c.*—Continued.

:c., of mail or apart-t.	Trips per week.	Pay per mile per annum.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of re-adjustment or adjustment.	Remarks.	Order.
and inches.		*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*			
f. f., s. l...	6	50 00	.....	.....	.....	Oct. 1, 1874	New; ordered July, 1875. Branch; main route $125, (72.)	245
.....	7	50 00	35 76	850 00	607 92	July 1, 1873	In March, 1875. Branch; main route $172, (49.) Ordered July, 1875.	246
ge apt.; no	12	50 00	.....	.....	.....	Feb. 2, 1874	In Dec., 1874. New; ordered Jan., 1875.	247
5.5, s. l.....	6	50 00	30 00	3,686 50	2,211 90	July 1, 1875	In Mar., 1875. Detached from 28002.	248
9, s. l.....	6	50 00	.....	.....	.....	Apr. 19, 1874	In June 1875. $50 on 38.69 miles formerly; residue new. Ordered Aug., 1875.	249
n baggage s. l.; no ibution.	6	50 00	52 66	790 00	790 00	July 1, 1873	In Dec., 1874. $40 m. m. Ordered Jan., 1875.	250
), f. f., s. l..	6	50 00	40 00	4,387 50	3,510 00	July 1, 1875	.....	251
7.8, f. f., s. l.	6	50 00	40 00	1,611 50	1,289 20	July 1, 1875	.....	252
y 7, f. f., s. l.	6	50 00	34 00	2,138 00	1,453 84	July 1, 1875	.....	253
9.5, f. f., s. l.	6	50 00	40 00	2,200 00	1,760 00	July 1, 1875	.....	254
6, f. f., s. l..	6	50 00	30 00	2,044 00	1,226 40	Dec. 1, 1873	In Oct., 1874. Ordered Dec., 1874.	255
5.6, f. f., s. l.	6	50 00	40 00	1,583 00	1,266 40	July 1, 1875	.....	256
.....	6	50 00	.....	.....	.....	Oct. 1, 1874	Branch; main route $125, (72.) New; ordered July, 1875.	257
no r. a.....	6	50 00	.....	.....	.....	Feb. 16, 1874	In Aug., 1875. New; ordered Sept., 1875.	258
no r. a.....	12	50 00	.....	.....	.....	Oct. 15, 1874	In Aug., 1875. New; ordered Sept., 1875. Branch.	259
.....	12	50 00	.....	.....	.....	Oct. 1, 1874	In May, 1875. New; ordered July, 1875.	260
—, f. f., s. l	6	50 00	.....	.....	.....	Nov. 1, 1873	In Sept., 1874. New; ordered Dec., 1874.	261
f. f., s. l....	6	50 00	40 00	1,759 50	1,407 60	July 1, 1875	.....	262
.....	18	50 00	.....	.....	.....	Apr. 1, 1875	In Apr., 1875. New; ordered June, 1875.	263
.....	6, 12	50 00	.....	.....	.....	Feb. 2, 1874	In Aug., 1874. $50 m. m. New; ordered Apr., 1875. 12 trips in summer.	264
no r. a.....	6	50 00	.....	.....	.....	May 5, 1873	New; ordered Sept., 1875.	265
no r. a.....	6	50 00	60 00	747 50	897 00	July 1, 1875	90 days, from Oct. 1, 1874. Branch; main route $90 (105.)	266
no r. a.....	12	50 00	.....	.....	.....	July 1, 1874	In May, 1875. New; ordered July, 1875.	267
no r. a.....	6	50 00	.....	.....	.....	Mar. 2, 1874	In Aug., 1875. New; ordered Sept., 1875.	268
; in charge nductor.	12	50 00	.....	.....	.....	Oct. 16, 1874	In Oct., 1874. New; ordered Jan., 1875.	269
no r. a.....	6	50 00	.....	.....	.....	Feb. 16, 1874	In Aug., 1875. New; ordered Sept., 1875.	270
.....	9*	45 00	40 00	1,125 00	1,000 00	July 1, 1875	.....	271
no r. a.....	6	45 00	40 00	731 25	650 00	July 1, 1875	.....	272
.10, f. f., s. l	6	45 00	40 00	2,002 50	1,780 00	July 1, 1875	Branch; main route $75, (144)	273
, f. f., s. l...	8½*	45 00	40 00	2,169 00	1,928 00	July 1875	.....	274

F.—*Table showing the re-adjustment of the rates of pay per mile on railroad*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails whole distance per day.	Miles per hour.
						Miles.	*Pounds.*	
275	Vt....	528	.....	Wells River, Montpelier.	Montpelier and Wells River..	38.62	82	18
276	Ill....	23045	23045	Carbondale, Marion ..	Carbondale and Shawneetown	18	76	18
277	Mich .	24032	24032	Muskegon, Big Rapids.	Chicago and Michigan Lake Shore.	56.64	75	20
278	Ill....	23046	23046	Jacksonville, Virden.	Jacksonville, Northwestern and Southeastern.	31.39	75	15
279	Mich .	24009	24009	West Branch, Otsego Lake.	Michigan Central.....	59.40	324	15
280	Mich .	24015	24015	Saint Clair Junction, South Saginaw.	Flint and Pere Marquette	4.15	161	12
281	Minn	26005	26001	Fargo, Bismarck	Northern Pacific.....	195.12	120	16
282	S. C...	5612	14009	Anderson Court-House, Walhalla.	Greenville and Columbia, (lessees Blue Ridge.)	34	103	15
283	Ohio..	9050	.....	Painesville, Niles.....	Painesville and Youngstown..	50.74	97	16
284	Minn	26010	26010	Hastings, Glencoe....	Chicago, Milwaukee and Saint Paul.	74.59	87	15
285	Miss..	7008	18008	Middleton Station, Ripley.	Ripley.....	24.30	84	15
286	Ind...	22032	.....	Frankfort, Kokomo ..	Frankfort and Kokomo.....	25.50	69	25
287	Tenn .	10011	19011	Knoxville, Careyville	Knoxville and Ohio.....	38.94	64	12
288	Tenn .	10014	19013	Tracy City, Cowan...	Tennessee Coal and Railroad Company.	23	63	12
289	Ill....	23054	23054	Chicago, Elgin	Chicago and Pacific.....	36	62	22
290	Pa....	2483	.....	Montrose, Tunkhannock.	Montrose	25.94	56	14
291	N. H..	352	.....	Nashua, Acton	Nashua, Acton and Boston....	23.44	54	22
292	Pa....	2490	.....	Mount Union, Broad Top.	East Broad Top Railroad and Coal Company.	32.23	53	15
293	N. J ..	2135	.....	Jersey City, Ringwood Furnace.	Montclair, (late New York and Oswego Midland.)	35.90	50	17
294	Md ...	3507	.....	Hagerstown, Williamsport.	Western Maryland	6.12	38	20
295	Pa....	2482	.....	Chambersburgh, Mont Alto.	Mont Alto.....	14.75	33	15
296	Mich .	24015	24015	Otter Lake Junction, Otter Lake.	Flint and Pere Marquette	14.53	31	19
297	Ill....	23042	23042	Bismarck, Youngstown.	Chicago, Danville and Vincennes.	25.90	27	15
298	Pa....	2497	.....	Lawsonham, Sligo....	Allegheny, (Sligo Branch.)....	10.47	19	15
299	Ind...	22022	.....	Princeton, Albion....	Louisville, New Albany and Saint Louis.	31.03	34	15
300	Minn .	26014	26014	New Ulm, Marshall ..	Chicago and Northwestern....	79.66	94	15
301	Mo ..	10502	28002	Cairo, Poplar Bluffs ..	Saint Louis and Iron Mountain and Cairo and Fulton.	73.73	57	15½
302	Wis ..	25017	25017	Colby, Worcester	Wisconsin Central.....	49.90	40	18

in States in which the contract term expired June 30, 1875, *&c.*—Continued.

c., of mail or apart-t.	Trips per week.	Pay per mile per annum.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of re-adjustment or adjustment.	Remarks.	Order.
nd inches.		*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*			
7 6.8. f. f.,	6	45 00	.....	.....	.....	Feb. 2, 1874	In Oct., 1874. New; ordered Dec., 1874.	275
, fixtures,	6	45 00	40 00	810 00	720 00	July 1, 1875	.....	276
f. f., a. l...	6	45 00	30 00	2,548 80	1,699 20	July 1, 1875	.....	277
4, fixtures,	6	45 00	40 00	1,412 55	1,255 60	July 1, 1875	.....	278
y 6, f. f., ½ l	3	40 00	50 00	2,376 00	2,970 00	July 1, 1875	Part; residue $60, (177.)	279
o r. a	Rem.	40 00	.....	.....	.....	Feb. 1, 1875	Trips occasional, by courtesy. New; ordered July, 1875. Branch; main route $96, (100.)	280
6. 20 by 8.8, 7.4, f. f. c.,	3	40 00	.....	.....	.....	April 1, 1874	New; ordered July, 1875. Part; residue $70, (152.)	281
o r. a	6	40 00	30 00	1,360 00	1,020 00	July 1, 1873	In Nov. and Dec., 1874; ordered Jan., 1875.	282
5, s. l	6	40 00	.....	.....	.....	July 1, 1874	New; ordered April, 1875. Pay fixed on 26.90 m. from Oct. 1, 1874.	283
0, f. f., a. l..	3, 6	40 00	50 00	2,983 60	3,729 50	July 1, 1875	Trips, 3 in March, 6 in June, 1875.	284
o r. a	6	40 00	30 00	972 00	729 00	July 1, 1874	In Sept., 1874; ordered Jan., 1875.	285
7.1, f. f.. a. l	6	40 00	.....	.....	.....	Oct. 1. 1874	In June, 1875. New; ordered Sept., 1875.	286
3, fixtures,	6	40 00	22 88	1,557 60	890 94	Feb. 1, 1874	In Aug., 1874; ordered Dec., 1874.	287
.....	6	40 00	30 00	920 00	690 00	July 1, 1873	In May, 1874; ordered Oct., 1874.	288
10. f. f., a. l	6	40 00	.....	.....	.....	Oct. 20, 1873	In Mar., 1875. New; ordered May, 1875.	289
1.6, f. f., a. l.	6	40 00	.....	.....	.....	Dec. 1, 1873	In July, 1874. New; ordered Dec., 1874.	290
y 6.8. fix-s.	6	40 00	.....	.....	.....	Sept. 1, 1873	In June, 1875. New; ordered April, 1875	291
; no r. a...	6	40 00	.....	.....	.....	Aug. 15, 1874	In June, 1875. New; ordered Sept., 1875	292
.....	6	40 00	.....	.....	.....	Oct. 20, 1873	In Dec., 1874. New; ordered April, 1875	293
8.6, fur-d, d. l.	12	40 00	.....	.....	.....	Mar. 2, 1874	In Sept., 1874; part; residue $75; ordered Dec., 1874.	294
o r. a	6	40 00	.....	.....	.....	Nov. 1, 1873	In Sept., 1874. New; ordered Feb., 1875.	295
b. c.....	6	40 00	.....	.....	.....	Feb. 1, 1875	Branch; main route $96, (100.) New; ordered July, 1875.	296
closet, 3 ; in charge nductor.	6	40 00	.....	.....	.....	July 1, 1874	In Jan., 1875. New; ordered Feb., 1875; branch.	297
; no r. a...	6	40 00	.....	.....	.....	Dec. 1, 1874	In May, 1875. New; ordered July, 1875.	298
corner of not parti-d, a. l.	6	35 00	.....	.....	.....	July 1, 1875	New; ordered July, 1875.	299
6.6, f. f., ½ l.	3	30 00	.....	.....	.....	May 1, 1872	New; ordered July, 1875. Part; residue $65, (166.)	300
5.5, ½ l.....	3½	30 00	.....	.....	.....	July 1, 1874	In Dec., 1874. New; ordered Apr., 1875; Branch; main route $100, &c.	301
7.7, f. f., a. l	6	30 00	.....	.....	.....	Nov. 1, 1874	New; ordered April, 1875. Part; residue $70, $40.	302

F.—*Table showing the re-adjustment of the rates of pay per mile on railroad*

Order.	State.	Number of route.	New number of route.	Termini.	Corporate title of company carrying the mail.	Length of route.	Average weight of mails whole distance per day.	Miles per hour.
						Miles.	*Pounds.*	
303	Wis ..	25017	25017	Colby, Medford.....	Wisconsin Central, (built and operated by Phillips & Colby Construction Company.)	16.30	24	12
304	Pa....	2487	.....	Valley Junction, Ebbvale,	Bachman Valley.....	13.3	14	14
305	Tex ..	8514	31008	Houston, Columbia...	International and Great Northern.	50	55	12
306	Ill	23057	23057	Saint Louis, Belleville.	Illinois and Saint Louis.....	16.25	41	....
307	Va....	4785	11017	Chester, Winterpock .	Richmond and Petersburgh...	18.50	11	15

Increase over former amount of annual pay by re-adjustment.....

routes in States in which the contract term expired June 30, 1875, *&c.*—Continued.

Size, &c., of mail car or apartment.	Trips per week.	Pay per mile per annum.	Former pay per mile per annum.	Amount of annual pay.	Former amount of annual pay.	Date of re-adjustment or adjustment.	Remarks.	Order.
Feet and inches.		*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*			
13.7 by 7.7, f. f., s.l	6	30 00	.....	.....	.....	Nov. 1, 1874	In Nov., 1874. ew; ordered Apr., 1875.	303
in charge of conductor.	6	30 00	.....	.....	.....	Mar. 10, 1874	In Oct., 1874. New; ordered Dec., 1874.	304
in b. c.....	2	25 00	.....	.....	.....	Nov. 16, 1874	In Mar., 1875. New; ordered July, 1875.	305
No r. a.....	3*	25 00	.....	.....	.....	July 1, 1874	In Sept., 1874. New; ordered Dec., 1874.	306
b. c.; no r. a	6	20 00	.....	.....	.....	Dec. 1, 1874	In July, 1875. New; ordered Sept., 1875.	307
				3,646,777 00	3,238,085 84			
				3,238,085 84	.....			
.....				408,691 16	.....			

JAS. N. TYNER,
Second Assistant Postmaster-General.

Index to Table F.

Title.	Order.	Number of route.	New number of route.
Alabama Central	196	6609	.....
Allegheny, (Sligo Branch)	298	2497	.....
Allegheny Valley	224	2480	.....
Atlanta and Richmond Air-Line	94	6017	15001
Atlanta and West Point	92	6003	15003
Atlantic and Pacific	15	10501	28001
Do	25	28001	28001
Do	70	10503	28003
Do	85	28003	28003
Do	194	10508	28008
Do	218	28008	28008
Bachman Valley	304	2487	.....
Baltimore and Ohio	60	9011	.....
Do	118	4101	.....
Do	205	3506	.....
Blue Ridge. (See Greenville and Columbia.)			
Boston, Barre and Gardner, (late Monadnock)	147	738	657
Boston, Concord and Montreal	264	359	.....
Boston and Maine	267	745	.....
Boston and Providence	66	608	.....
Do	76	608	.....
Brunswick and Chillicothe, and Saint Louis, Council Bluffs and Omaha	249	28013	28013
Buffalo Valley	269	2495	.....
Burlington, Cedar Rapids and Minnesota	113	27001	27001
Do	213	27002	27002
Do	243	27003	27003
Do	252	27004	27004
Burlington and Missouri River	18	27005	27005
Do	158	27005	27005
Do	165	27007	27007
Burlington and Southwestern	223	27008	27008
Cairo and Saint Louis	232	11923	23053
Cairo and Vincennes	135	23037	23037
Camden and Atlantic	176	2107	.....
Carbondale and Shawneetown	276	23045	23045
Carolina Central	198	5003	13003
Central Branch Union Pacific	97	14002	33002
Central, of Iowa	161	27010	27010
Central Ohio	14	9001	.....
Central Railroad and Banking, of Georgia	127	6009	15010
Do	129	6004	15005
Chicago and Alton	27	23017	23017
Do	69	28022	28022
Do	87	23018	23018
Chicago, Burlington and Quincy	9	23007	23007
Do	46	23009	23009
Do	163	23008	23008
Do	174	23011	23011
Do	183	23007	23007
Do	187	23008	23008
Do	240	23014	23014
Chicago, Danville and Vincennes	142	23042	23042
Do	297	23042	23042
Chicago, Dubuque and Minnesota	156	27012	27012
Chicago and Illinois Southern, Consolidated	256	23044	23044
Chicago and Michigan Lake Shore	119	24021	24021
Do	157	24021	24021
Do	277	24032	24032
Chicago, Milwaukee and Saint Paul	20	25002	25002
Do	34	26013	26013
Do	35	23035	23035
Do	61	26011	26011
Do	101	26009	26009
Do	126	25003	25003
Do	186	25004	25004
Do	188	27025	27025
Do	221	26012	26012
Chicago, Milwaukee and Saint Paul	231	25005	25005
Do	251	27028	27028
Do	272	25007	25007
Do	284	26010	26010
Chicago and Northwestern	13	23003	23003
Do	23	23001	23001
Do	24	25009	25009
Do	30	23002	23002
Do	38	25012	25012
Do	74	25010	25010
Do	102	24031	24031
Do	138	25011	25011
Do	148	25010	25010
Do	155	25024	25013
Do	166	26014	26014
Do	254	23004	23004
Do	265	23056	23056
Do	300	26014	26014
Chicago and Pacific	289	23054	23054
Chicago, Rock Island and Pacific	8	23015	23015
Do	10	23015	23015
Do	11	27014	27014
Do	12	27014	27014
Do	95	23016	23016
Do	114	27017	27017
Do	197	27015	27015
Do	242	27016	27016
Continental Improvement Company	219	24034	24034
Cumberland Valley	132	2430	.....
Do	133	2430	.....
Dakota Southern	123	35001	35001
Do	172	13920	35001
Davenport and Saint Paul	214	27027	27027
Do	215	27018	27018
Do	253	27018	27018
Des Moines and Fort Dodge	206	27031	27031
Des Moines and Minnesota	238	27030	27030
Detroit and Bay City	115	24013	24013
Detroit, Hillsdale and Indiana	220	24024	24024
Detroit, Lansing and Lake Michigan	131	24017	24017
Do	235	24033	24033
Detroit and Milwaukee	86	24006	24006
Dubuque Southwestern	210	27020	27020
Duxbury and Cohasset	239	747	.....
East Broad Top Railroad and Coal Company	292	2490	.....
Eastern	258	742	.....
Do	268	743	.....
Do	270	741	.....
Elizabethtown and Paducah	167	9738	.....
Elliott, W. P., owner. (See Rogersville and Jefferson.)			
Flint and Pere Marquette	178	24015	24015
Do	100	24015	24015
Do	280	24015	24015
Do	296	24015	24015
Frankfort and Kokomo	286	22032	.....
Galveston, Harrisburgh and San Antonio	117	8504	31002
Galveston, Houston and Henderson	59	8502	.....
Do	67	8502	31001
Geneva, Ithaca and Athens	173	1293	.....
Green Bay and Minnesota, (late Green Bay and Lake Pepin)	209	25015	25015
Greenville and Columbia, (lessees Blue Ridge)	282	5612	14009
Grand Rapids and Indiana	130	24018	24018
Do	191	24038	24038
Grand Tower Mining, Manufacturing, and Transportation Company	271	23039	23039
Grand Trunk	107	24007	24007
Hannibal and Saint Joseph	19	28005	28005

Index to Table F—Continued.

Title.	Order.	Number of route.	New number of route.
annibal and Saint Joseph	21	28010	28010
Do	228	28005	28005
empfield	200	2441	.....
ouston and Texas Central	58	8503	.....
ouston and Texas Central, (operating Waco and Northwestern)	139	8577*a*	.....
linois Central	36	23020	23020
Do	47	23021	23021
Do	82	27021	27021
Do	145	27022	27022
llinois and Saint Louis	306	23057	23057
ndiana and Illinois Central	222	23055	23055
nternational and Great Northern	72	8683	31006
Do	81	8683 8666	8683
Do	226	8666	31007
Do	245	8683	31006
Do	257	8683	31006
Do	305	8514	31008
ndianapolis and Saint Louis	37	12024	22024
Do	40	11419	23028
owa Midland	225	27024	27024
acksonville, Northwestern and Southeastern	278	23046	23046
acksonville, Pensacola and Mobile	104	6402	.....
ansas City, Saint Joseph and Council Bluffs	48	28006	28006
Do	149	28006	28028
eokuk and Des Moines	134	27019	27019
eokuk and Kansas City	233	10525*a*	28025
noxville and Ohio	287	10011	19011
ake Shore and Mich. Southern	63	24001	24001
Do	106	24004	24004
Do	124	24002	24002
Do	164	24003	24003
Do	182	24028	24028
ake Superior and Mississippi	109	26006	26007
eavenworth, Lawrence and Galveston	116	14211	33008
Do	128	14003	33003
Do	190	14003	33003
ewisburg Center and Spruce Creek. (See Pennsylvania.)			
ouisville, New Albany and Saint Louis	299	22022	.....
ouisville, Paducah and Southwestern, (late Elizabethtown and Paducah)	168	9738	20011
acon and Augusta	203	6145	15021
arietta and Cincinnati	7	9032	.....
Do	50	9020	.....
Do	120	9019	.....
arietta, Pittsburgh and Cleveland	227	9044	.....
emphis and Little Rock	91	7501	29001
ichigan Central	26	24005	24005
Do	108	24010	24010
Do	177	24009	24009
Do	208	24025	24025
Do	279	24009	24009
ichigan Midland and Canada	247	24037	24037
idland Pacific	192	34005	.....
Do	193	34005	.....
ilwaukee, Lake Shore and Western	144	25018	25018
Do	273	25018	25018
ississippi Valley and Western	141	28018	28018
issouri River, Fort Scott and Gulf	99	14005	33005
onadnock. (See Boston, Barre and Gardner.)			
ont Alto	295	2482	.....
ont Clair, (late New York and Oswego Midland)	293	2135	.....
Montpelier and Wells River	275	528	.....
Montrose	290	2483	.....
Morgan's Louisiana and Texas	88	8001	30003
Nashua, Acton and Boston	291	352	.....
Naugatuck	84	908	.....
Newark, Somerset and Straitsville	140	9042	.....
New Bedford	73	642	.....
Do	80	641	.....
New Bedford, (operating Boston, Clinton and Fitchburgh)	137	746	.....
New Jersey Southern	159	2126	.....
New Orleans, Saint Louis and Chicago	42	8002	30001
Do	43	7001	18001
Do	44	7001	18001
New York and Oswego Midland. (See Mont Clair.)			
New York Central and Hudson River	263	1805	.....
New York, New Haven and Hartford	2	907	.....
Do	4	905	.....
Do	5	907	.....
Do	6	905	.....
Do	259	905	.....
Northern Pacific	152	26005	26001
Do	281	26005	26001
North Louisiana and Texas	212	8005	30008
Ohio and Mississippi	16	12010	22010
Do	17	12010	22010
Do	22	12010	22010
Do	45	12018	22018
Do	64	12018	22018
Old Colony, (late Old Colony and Newport)	71	654	634
Oregon and California	96	.....	44001
Painesville and Youngstown	283	9050	.....
Parker and Karn's City	179	2491	.....
Pennsylvania	1	2103	.....
Do	98	2105	.....
Do	105	2105	.....
Do	110	2103	.....
Pennsylvania, (lessees Lewisburgh Center and Spruce Creek)	180	2468	.....
Pennsylvania	199	2103	.....
Do	266	2105	.....
Peoria and Rock Island	170	23040	23040
Petersburgh	33	4410	11009
Philadelphia, Wilmington and Baltimore	3	3501	.....
Do	54	3401	.....
Do	79	3401	.....
Pittsburgh, Virginia and Charleston	160	2486	.....
Do	230	2486	.....
Portland and Ogdensburgh	65	202	12
Providence and Springfield	241	823	.....
Quincy, Alton and Saint Louis	51	23041	23041
Do	112	23041	23041
Quincy, Missouri and Pacific	184	28019	28019
Richmond and Danville	50	4407	.....
Do	52	5004	13004
Richmond and Petersburgh	28	4409	11008
Do	307	4785	11017
Ripley	285	7008	18008
Rockford, Rock Island and Saint Louis	169	23005	23005
Rogersville and Jeffersonville, (W. P. Elliott, owner)	250	10003	19003
Saginaw Valley and Saint Louis	262	24030	24030
Savannah and Memphis	237	6616	17016
Saint Louis, Alton and Terre Haute	83	23030	23030

Index to Table F—Continued.

Title.	Order.	Number of route.	New number of route.
Saint Louis and Iron Mountain and Cairo and Fulton	78	10502	28002
Do	301	10502	28002
Saint Louis and Saint Joseph. (See Saint Louis, Kansas City and Northern.)			
Saint Louis, Iron Mountain and Southern, (late Saint Louis and Iron Mountain and Cairo and Fulton)	55	28002	28026
	68	28002	28002
Do	248	28002	28027
Do			
Saint Louis, Kansas City and Northern	57	28004	28004
	122	28007	28007
Do			
Saint Louis, Kansas City and Northern, (late Saint Louis and Saint Joseph)	216	28012	28012
	244	28009	28009
Do			
Saint Louis, Lawrence] and Western	136	10517*a*	.....
	143	10517*a*	28016
		14311	33011
Do	185	28016	28016
Do			
Saint Louis, Salem and Little Rock	255	10524*a*	28023
	146	26002	26003
Saint Paul and Pacific	195	26001	26002
Do	202	26003	26004
Do	89	26004	26005
Saint Paul and Sioux City	90	27029	27029
Sioux City and Pacific	121	26004	26018
Sioux City and Saint Paul			
Somerset	236	231	.....
Southern Minnesota	153	26016	26016
Springfield, Athol and Northeastern, (late Athol and Enfield)	189	658	741
Springfield and Northwestern	274	23049	23049
Springfield, Illinois and Southeastern	150	23033	23033
Sycamore and Courtland	204	23052	23052
Tennessee Coal and Railroad	288	10014	19013
Terre Haute and Indianapolis	29	12002	22002
Do	32	23001	23001
Do	41	11425	23031
Texas and Pacific	62	8749	31010
Do	77	8749	.....
Do	103	8506	31009
Do	162	8770	.....
Texas and Pacific, (Transcontinental Division)	217	8770	31011
Toledo, Canada Southern and Detroit	111	12956	24035
Toledo, Peoria and Warsaw	151	23027	23027
Toledo, Wabash and Western	39	23023	23023
Do	75	23025	23025
Utah Northern	261	16651	41003
Utica and Black River	260	1294	.....
Vicksburgh and Meridian	181	7003	18003
Washington City, Virginia Midland and Great Southern	211	4405	11003
Do	229	4782	11016
Washington and Ohio	207	4404	11004
Western and Atlantic	31	6002	15002
Western Maryland	294	3507	.....
Western, of Alabama	93	6601	17001
Do	171	6607	17007
Do	201	6602	17002
Western Union	125	25013	25024
Wilmington, Columbia and Augusta	56	5604	14002
Wilmington and Weldon	49	5002	13002
Do	246	5002	13002
Wisconsin Central, (operated by Phillips & Colby Construction Company)	154	25016	25016
Do	175	25016	25016
Do	234	25017	25017
Do	302	25017	25017
Do	303	25017	25017

G.—*Statement of the number, description, and cost of mail-bags and mail-bag catchers purchased by contract and put into service during the fiscal year ended June* 30, 1875, *viz:*

Number.	Description.	Size.	Price.	Cost.	Aggregate.
1,100	Leather mail-pouches	No. 1	$8 20	$9,020 00	
2,100	.....do	No. 2	6 45	13,545 00	
2,400	.....do	No. 3	5 50	13,200 00	
3,600	.....do	No. 4	4 35	15,660 00	
1,900	.....do	No. 5	3 20	6,080 00	
11,100					$57,505 00
500	Leather horse-mail-bags	No. 1	6 65	3,325 00	
550	.....do	No. 2	5 65	3,107 50	
400	.....do	No. 3	5 15	2,060 00	
1,450					8,492 50
53,000	Jute canvas mail-sacks	No. 1	57	30,210 00	
8,500	.....do	No. 2	46	3,910 00	
3,000	.....do	No. 3	15	450 00	
64,500					34,570 00
500	Cotton canvas mail-sacks	No. 2	74½	372 50	
2,000	.....do	No. 3	21	420 00	
500	Striped cotton sacks, (foreign mails)	.....	40	200 00	
3,000					992 50
260	Mail-catcher handles	.....	40	104 00	
20	Mail-catcher sockets	.....	70	14 00	
	Mail-catcher repairs	.....	.....	557 25	
					675 25
15,981	Mail-bag label-cases	.....	25	3,995 25	
255,320	Printed wooden labels	.....	11-16	1,755 32½	
2,200	.....do	.....		11 00	
					5,761 57½
					107,996 82½

Number, description, and cost of mail locks and keys purchased under contract during the fiscal year ended June 30, 1875, *viz:*

Number.	Description.	Price.	Cost.
5,000	Brass (through) mail-locks	$0 74	$3,700 00
20,000	Brass street-letter-box locks	1 25	25,000 00
6,000	Steel keys for street-letter-box locks	15	900 00
6,000	Brass safety-chains for mail-keys	22½	1,350 00
500	Brass through registered mail-locks	1 75	875 00
100	Nickel-plated keys for same	15	15 00
			31,840 00

JAMES N. TYNER,
Second Assistant Postmaster-General.

II.—*Railway post-office lines in the United States June 30, 1875, showing the increase in the service since June 30, 1874.*

Terminal points.	Miles of route.	Miles of service.	Service each way.	Number of clerks.			Increase of miles of route from June 30, 1874, to June 30, 1875.	Increase of miles of service from June 30, 1874, to June 30, 1875.	Increase in number of clerks from June 30, 1874, to June 30, 1875.			Increase in lines of railway post-offices from June 30, 1874, to June 30, 1875.
				$1,400.	$1,200.	$1,000.			$1,400.	$1,200.	$1,000.	
Albany, N. Y., to Buffalo, N. Y	298	1,192	Twice daily	12	8	8			1			
Atlanta, Ga., to Augusta, Ga	171	342	Daily		4							
Baltimore, Md., to Canandaigua, N. Y	325	650	....do	4	3	3			(a)	(a)	3	
Baltimore, Md., to Grafton, W. Va	280	1,120	Twice daily	8	4	7			2	(b)	6	
Bangor, Me., to Vanceborough, Me	118	236	Daily			4						
Bloomington, Ill., to Mexico, Mo	200	400	....do	2	4							
Boston, Mass., to Portland, Me	116	232	....do	4	4	1						
Boston, Mass., to Saint Albans, Vt	290	580	....do	4	8					4		
Boston, Mass., to Albany, N. Y	200	800	Twice daily	10	8	8					4	
Boston, Mass., to Wellfleet, Mass	122	244	Daily		6							
Boston, Mass., to Fitchburgh, Mass	50	100	....do			1						
Boston, Mass., to Bangor, Me	249	996	Twice daily	11	13							
Bristol, Tenn., to Chattanooga, Tenn	242	484	Daily	4	6							
Buffalo, N. Y., to Toledo, Ohio	295	1,180	Twice daily	12	18	22			2	3	5	
Burlington, Iowa, to Council Bluffs, Iowa	291	582	Daily	4	4							
Cairo, Ill., to Centralia, Ill	112	224	....do	2	5					1		
Chattanooga, Tenn., to Atlanta, Ga	140	280	....do	3	3							
Chicago, Ill., to Fort Howard, Wis	242	484	....do	4	10					1		
Chicago, Ill., to Toledo, Ohio	243	972	Twice daily	9	16	11			2	3	(c)	
Chicago, Ill., to Quincy, Ill	263	526	Daily	6	11				1			
Chicago, Ill., to Freeport, Ill (d)	121	242	....do	3	4		(e)	(f)	(a)			
Chicago, Ill., to Cincinnati, Ohio	310	620	....do	4	7				3	(g)		
Chicago, Ill., to Iowa City, Iowa	237	474	....do	6	7					1		
Chicago, Ill., to Cedar Rapids, Iowa	219	438	....do	5	6				1			
Chicago, Ill., to Centralia, Ill	258	516	....do	5	10					2		
Chicago, Ill., to Saint Louis, Mo	280	560	....do	6	9				1	1		
Cleveland, Ohio, to Cincinnati, Ohio	244	488	....do	5	7	1					1	
Cleveland, Ohio, to Indianapolis, Ind	282½	565	....do	3	5				(g)	1		
Cincinnati, Ohio, to Louisville, Ky	126	252	....do		6		126	252		6		1
Cincinnati, Ohio, to Saint Louis, Mo	340	680	....do	4	10					(g)		
Clinton, Iowa, to Council Bluffs, Iowa	350	700	....do	5	4				1	(g)		
Davenport, Iowa, to Council Bluffs, Iowa	307	614	....do	4	6				1	(a)		
Detroit, Mich., to Chicago, Ill	284	568	....do	3	6					(g)		
Dubuque, Iowa, to Fort Dodge, Iowa	214	428	....do	3	3				(g)	1		
Dubuque, Iowa, to Centralia, Ill (h)	345	690	....do	6	5		70	140	1	(g)		
Grafton, W. Va., to Cincinnati, Ohio	300	1,236	Twice daily	4	8	1			3	(i)	1	
Grafton, W. Va., to Chicago, Ill (k)	559	1,118	Daily	5	10		326	652	5	2		
Indianapolis, Ind., to Saint Louis, Mo	261	522	....do	4	5				(g)	1		

Kansas City, Mo., to Council Bluffs, Iowa	200	400	....do	4	3				1	(g)		
La Fayette, Ind., to Quincy, Ill	273	546	....do	5	15				(g)	2		
Louisville, Ky., to Nashville, Tenn	185	370	....do	5	5				2	(g)		
Lynchburgh, Va., to Bristol, Tenn	203	406	....do	4	5					(g)		
Memphis, Tenn., to Chattanooga, Tenn	310	620	....do	6	6				(g)			
Milwaukee, Wis., to Saint Paul, Minn	324	648	....do	8	9				1	(a)		
New Orleans, La., to Cairo, Ill (l)	548	1,096	....do	7	12		66	132	4	(g)		
New York, N. Y., to Boston, Mass	234	936	Twice daily	11	20	9				1		
New York, N. Y., to Washington, D. C	232	928	....do	12	9	*10			1	(g)		
New York, N. Y., to Buffalo, N. Y	422	1,688	....do	15	14	18			1	1	4	
New York, N. Y., to Albany, N. Y	144	576	....do	5	5	5			1	1		
Omaha, Neb., to Ogden, Utah	1,032	2,064	Daily	14	21					1		
Philadelphia, Pa., to Pittsburgh, Pa	358	716	... do	5	5	5			(g)		(g)	
Peoria, Iowa, to Burlington, Iowa (m)	43	86	....do	1	1							
Quincy, Ill., to Kansas City, Mo	261	522	....do	4	6					1		
Quincy, Ill., to Denison, Tex (n)	593	1,186	....do	9	9		18	36	8	(o)		
Rochester, N. Y., to Niagara Falls, N. Y	77	154	....do		3							
San Francisco, Cal., to Ogden, Utah	881	1,762	....do	11	16					1		
Saint Louis, Mo., to Atchison, Kan	330	660	....do	6	7				1	(g)		
Toledo, Ohio, to La Fayette, Ind	203	406	....do	4	12				1	2		
Washington, D. C., to Weldon, N. C	216	864	Twice daily	12	9	2			3	(c)	(g)	
Washington, D. C., to Lynchburgh, Va	178	356	Daily	4	4	1			1	(g)	1	
Hornellsville, N. Y., to Dunkirk, N. Y (p)	128	256	...do									

Recapitulation and comparative statement of the service of June 30, 1874, and June 30, 1875, showing the increase.

	June 30, 1874.		June 30, 1875.		Increase.	
Number of lines of railway post-offices		63		62		....
Aggregate number of miles of the above		16,414		16,932		518
Number of miles of actual service performed daily		39,199		40,109		910
Number of miles of actual service performed annually		14,307,635		14,639,785		332,150
Number of head clerks at $1,400 per annum	288		326		38	
Number of clerks at $1,200 per annum	465		457		(i)	
Number of assistant clerks at $1,000 per annum	97		117		20	
*An assistant clerk at $840 per annum	....		1		1	
Making total number of clerks		850		901		51
With annual compensation amounting to		$1,058,200		$1,122,640		$64,440

a Reduction of two. *b* Reduction of six. *c* Reduction of three. *d* Formerly Chicago to Dunleith, Ill., now curtailed to Freeport.
e Decreased 67. *f* Decreased 134. *g* Reduction of one. *h* Formerly Freeport to Centralia, Ill., now extended to Dubuque, Iowa.
i Reduction of eight. *k* Formerly Grafton, W. Va., to Columbus, Ohio, now curtailed and extended to Chicago, Ill.
l Formerly New Orleans, La., to Canton, Miss., now consolidated with Humboldt, Tenn., and Jackson, Miss., and extended to Cairo, Ill.
m Distance from Peoria to Galesburgh, Ill., included in Indianapolis, Ind., to Galesburgh, Ill. *n* Formerly Hannibal, Mo., to Denison, Tex., now extended to Quincy, Ill.
o Reduction of nine. *p* Number of clerks included in New York, to Buffalo, N. Y.

NOTE.—Since last report the following railway post-office lines have been discontinued, viz: Cairo, Ill., to Columbus, Ky., (by river,) discontinuance of service. Humboldt, Tenn., to Jackson, Miss., by extension of New Orleans, La., to Canton, Miss., to Cairo, Ill.

JAS. N. TYNER,
Second Assistant Postmaster-General.

Statements showing operations and results of foreign mail service for the fiscal year ended June 30, 1875.

The postages on United States and European mails were as follows:

The aggregate amount of letter postage (sea, inland, and foreign) on the mails exchanged—

With the United Kingdom	$672,189 28
With Germany	371,239 74
With France	119,059 24
With Belgium	15,236 68
With the Netherlands	19,863 46
With Italy	47,436 49
With Switzerland	37,244 74
With Denmark	18,814 21
With Norway	31,636 97
With Sweden	50,608 88
Total postages	$1,383,329 69

Being a decrease of $55,470.96, compared with the amount reported for the previous year.

The postages on mails *sent* to Europe were as follows, viz:

To the United Kingdom	$347,925 90
To Germany	195,488 22
To France	53,842 47
To Belgium	6,176 78
To the Netherlands	9,800 18
To Italy	19,856 62
To Switzerland	17,663 09
To Denmark	9,003 65
To Norway	16,537 20
To Sweden	22,388 81
Total	$698,682 92

The postages on mails *received* from Europe were as follows, viz:

From the United Kingdom	$324,263 38
From Germany	175,751 52
From France	65,216 77
From Belgium	9,059 90
From the Netherlands	10,063 28
From Italy	27,579 87
From Switzerland	19,581 65
From Denmark	9,810 56
From Norway	15,099 77
From Sweden	28,220 07
Total	$684,646 77

Postages collected in the United States	$783,364 79
Postages collected in Europe	599,964 90
Excess of collections in the United States	$183,399 89

Number of letters (single rates) *sent* from the United States	9,746,435
Number of letters (single rates) *received* from Europe	9,206,102
Total	18,952,537

Being a decrease of 1,014,505, compared with the number reported for the previous year.

The excess of postages on mails *sent* from the United States to different countries of Europe, over that on mails *received* from the same countries, was as follows:

United Kingdom	$23,662 52
Germany	19,736 70
Norway	1,437 43
Total	$44,836 65

The excess of postages on mails *received* over those on mails *sent* was as follows:

France	$11,374 30
Belgium	2,883 12
The Netherlands	263 10
Italy	7,773 25
Switzerland	1,918 56
Denmark	806 91
Sweden	5,831 26
Total	$30,850 50

Payments during fiscal year ended June 30, 1875, to ocean-steamship lines transporting mails for the sea-postages as compensation for the service:

Cunard line		$52,317 05
Hamburg line		46,486 86
North German Lloyd line		39,993 00
White Star line		27,029 13
Williams & Guion line		20,833 87
Eagle line		18,402 65
Inman line		11,368 74
Canadian line		4,876 68
Anchor line		794 55
General Transatlantic Steamship Company		1,924 68
National line		154 88
Red Star line		42 51
Netherlands Steam Navigation Company		86 86
Snow & Burgess line		1,386 31
Thayer & Lincoln line		84 74
American Steamship Company		2,315 74
		$228,098 25
To Pacific Mail Steamship Company	$36,748 66	
To West Indies, Mexico, Brazil, &c	69,509 62	
To Nova Scotia	1,985 88	
To Canada	194 25	
		108,438 41
Total		$336,536 66

Weight of correspondence exchanged during the fiscal year ended June 30, 1875, between the United States and the countries of Europe with which the United States have concluded postal conventions.

Countries.	LETTER MAILS.						PRINTED MATTER AND SAMPLES.						Total weight of mails exchanged with European countries.	
	From the United States.		To the United States.		Total.		From the United States.		To the United States.		Total.			
	Grams.	Ounces.	Grams.	Ounces.	Grams.	Ounces.	Grams.	Ounces.	Grams.	Ounces.	Grams.	Ounces.	Grams.	Ounces.
United Kingdom	.....	1, 767, 868½	.....	1, 646, 056½	.....	3, 413, 925	.....	7, 211, 622½	.....	10, 875, 022½	.....	18, 086, 645½	.....	21, 500, 570½
Germany	27, 134, 848	.....	23, 698, 862	.....	50, 833, 710	.....	74, 111, 371	.....	33, 813, 424	.....	107, 924, 795	.....	158, 758, 505	.....
France	5, 048, 774	.....	4, 701, 274	.....	9, 750, 048	.....	17, 004, 373	.....	13, 251, 088	.....	30, 255, 461	.....	40, 005, 509	.....
Belgium	712, 045	.....	811, 327	.....	1, 523, 372	.....	2, 406, 589	.....	2, 673, 012	.....	5, 079, 601	.....	6, 602, 973	.....
The Netherlands	940, 032	.....	882, 846	.....	1, 822, 878	.....	1, 959, 725	.....	1, 827, 755	.....	3, 787, 480	.....	5, 610, 358	.....
Switzerland	1, 282, 486	.....	1, 553, 255	.....	2, 835, 741	.....	6, 920, 422	.....	4, 310, 644	.....	11, 231, 066	.....	14, 066, 807	.....
Italy	1, 664, 277	.....	1, 701, 409	.....	3, 365, 686	.....	5, 310, 071	.....	2, 608, 380	.....	7, 918, 451	.....	11, 284, 137	.....
Denmark	1, 144, 722	.....	1, 086, 286	.....	2, 231, 008	.....	1, 387, 029	.....	1, 753, 490	.....	3, 140, 519	.....	5, 371, 527	.....
Sweden	2, 092, 134	.....	1, 623, 640	.....	3, 715, 774	.....	2, 466, 684	.....	1, 657, 455	.....	4, 124, 139	.....	7, 839, 913	.....
Norway	1, 456, 486	.....	1, 005, 320	.....	2, 461, 806	.....	1, 712, 287	.....	591, 720	.....	2, 304, 007	.....	4, 765, 813	.....
Total grams and equivalents in ounces	41, 475, 804	1, 463, 072	37, 064, 219	1, 307, 541	78, 540, 023	2, 770, 713	113, 278, 551	3, 996, 209	62, 486, 968	2, 204, 398	175, 765, 519	6, 200, 607	254, 305, 542	8, 971, 320
Total	.....	3, 231, 040½	.....	2, 953, 597½	.....	6, 184, 638	.....	11, 207, 831½	.....	13, 079, 420¾	.....	24, 287, 252½	.....	30, 471, 890½
Decrease from 1874	.....	234, 406½	.....	48, 751	.....	283, 157	.....	477, 294½	.....	.....	.....	209, 803¾	.....	492, 940½
Increase over 1874	.....	.....	.....	.....	.....	.....	.....	.....	.....	267, 491	.....	.....	.....	.....
Decrease from 1874	.....	.....	.....	.....	.....	*Tons.* 8	.....	.....	.....	.....	.....	*Tons.* 6	.....	.....

mber of letters and newspapers and amounts of United States postage (so far as reported) on mails exchanged with Canada, the West Indies, &c.

Country.	Number of letters.	Number of newspapers.	United States postages.
ish Provinces*	4,318,783	1,011,229	$136,111 84
st India Islands	923,792	328,599	87,568 61
ama and Central America	220,340	250,371	33,361 35
an and China	217,919	268,225	25,696 05
zil	96,982	95,867	16,375 18
dwich Islands, New Zealand, and Australia	159,373	226,367	13,978 54
tico	68,436	63,156	6,304 84
ador	6,835	8,579	1,538 58
r Granada	19,873	14,287	2,281 18
ezuela	5,942	2,962	447 78
a Scotia, Newfoundland, and Bermuda	94,769	17,170	6,773 26
Totals	6,183,244	2,286,812	$330,437 21

* For six months to January 1, 1875, when new arrangement went into effect.

Total of letters exchanged with foreign countries during fiscal year.

eived	12,281,248
t	12,854,333
Total	25,135,581
Decrease from last year	3,443,264

TREATY

CONCERNING

THE FORMATION OF A GENERAL POSTAL UNION.

SIGNED AT BERNE, OCTOBER 9, 1874.

[This treaty, as signed, was in the French language only. The English translation has been added in Washington.]

TRAITÉ concernant la création d'une Union générale des Postes, conclu entre l'Allemagne, l'Autriche-Hongrie, la Belgique, le Danemark, l'Egypte, l'Espagne, les Etats-Unis d'Amérique, la France, la Grande-Bretagne, la Grèce, l'Italie, le Luxembourg, la Norvège, les Pays-Bas, le Portugal, la Roumanie, la Russie, la Serbie, la Suède, la Suisse et la Turquie.

Les soussignés, plénipotentiaires des Gouvernements des pays ci-dessus énumérés, ont d'un commun accord, et sous réserve de ratification, arrêté la Convention suivante:

TREATY concerning the formation of a General Postal Union, concluded between Germany, Austro-Hungary, Belgium, Denmark, Egypt, Spain, the United States of America, France, Great Britain, Greece, Italy, Luxemburg, Norway, the Netherlands, Portugal, Roumania, Russia, Servia, Sweden, Switzerland, and Turkey.

The undersigned, plenipotentiaries of the Governments of the countries above enumerated, have by common consent, and subject to ratification, agreed upon the following Convention:

ARTICLE I.

Les pays entre lesquels est conclu le présent traité formeront, sous la désignation de *Union générale des postes*, un seul territoire postal pour l'échange réciproque des correspondances entre leurs bureaux de poste.

ARTICLE I.

The countries between which the present treaty is concluded shall form, under the title of "General Postal Union," a single postal territory for the reciprocal exchange of correspondence between their Post Offices.

ARTICLE II.

Les dispositions de ce traité s'étendront aux lettres, aux cartes-correspondance, aux livres, aux journaux et autres imprimés, aux échantillons de marchandises et aux papiers d'affaires originaires de l'un des pays de l'Union et à des-

ARTICLE II.

The stipulations of this treaty shall extend to letters, post-cards, books, newspapers, and other printed papers, patterns of merchandize, and legal and commercial documents originating in one of the countries of the Union and in-

d'un autre de ces pays. appliqueront également à e postal des objets ci-dese les pays de l'Union et les angers à l'Union toutes les e cet échange emprunte oire de deux des parties antes au moins.

tended for another of those countries. They shall also apply to the exchange by post of the articles above mentioned between the countries of the Union and countries foreign to the Union whenever such exchange takes place over the territory of two at least of the contracting parties.

ARTICLE III.

xe générale de l'Union est 25 centimes pour la lettre affranchie.

fois, comme mesure de transest réservé à chaque pays, nir compte de ses convemonétaires ou autres, la le percevoir une taxe supéu inférieure à ce chiffre, ant qu'elle ne dépasse pas mes et ne descende pas aude 20 centimes.

considérée comme lettre oute lettre dont le poids ne pas 15 grammes. La taxe res dépassant ce poids sera rt simple par 15 grammes ion de 15 grammes.

ort des lettres non affranra le double de la taxe du destination pour les lettres ies.

anchissement des cartes-ndance est obligatoire. xe est fixée à la moitié de s lettres affranchies, avec l'arrondir les fractions.

tout transport maritime de 300 milles marins dans le de l'Union, il pourra être u port ordinaire une sur. ne pourra pas dépasser la de la taxe générale de fixée pour la lettre affran-

ARTICLE III.

The general Union rate of postage is fixed at 25 centimes for the single prepaid letter.

Nevertheless, as a measure of conversion, the option is reserved to each country, in order to suit its monetary or other requirements, of levying a rate higher or lower than this charge, provided that it does not exceed 32 centimes or go below 20 centimes.

Every letter which does not exceed 15 grammes in weight shall be considered a single letter. The charge upon letters exceeding that weight shall be a single rate for every 15 grammes or fraction of 15 grammes.*

The charge on unpaid letters shall be double the rate levied in the country of destination on prepaid letters.

The prepayment of post-cards is compulsory. The postage to be charged upon them is fixed at one-half of that on paid letters, with power to round off the fractions.

For all conveyance by sea of more than 300 nautical miles within the district of the Union, there may be joined to the ordinary postage an additional charge which shall not exceed the half of the general Union rate fixed for a paid letter.

ARTICLE IV.

xe générale de l'Union pour ers d'affaires, les échantilnarchandises, les journaux,

ARTICLE IV.

The general Union rate for legal and commercial documents, patterns of merchandise, newspapers,

ticle 24 of the Detailed Regulations for carrying this Treaty into effect, any which has not adopted the decimal metrical system of weight may substitute unce for 15 grammes.

les livres brochés ou reliés, les brochures, les papiers de musique, les cartes de visite, les catalogues, les prospectus, annonces et avis divers, imprimés, gravés, lithographiés ou autographiés, ainsi que les photographies, est fixée à 7 centimes pour chaque envoi simple.

Toutefois, comme mesure de transition, il est réservé à chaque pays, pour tenir compte de ses convenances monétaires ou autres, la faculté de percevoir une taxe supérieure ou inférieure à ce chiffre, moyennant qu'elle ne dépasse pas 11 centimes et ne descende pas au-dessous de 5 centimes.

Sera considéré comme envoi simple tout envoi dont le poids ne dépasse pas 50 grammes. La taxe des envois dépassant ce poids sera d'un port simple par 50 grammes ou fraction de 50 grammes.

Pour tout transport maritime de plus de 300 milles marins dans le ressort de l'Union, il pourra être ajouté au port ordinaire une surtaxe qui ne pourra pas dépasser la moitié de la taxe générale de l'Union fixée pour les objets de cette catégorie.

Le poids maximum des objets mentionnés ci-dessus est fixé à 250 grammes pour les échantillons et à 1000 grammes pour tous les autres.

Est réservé le droit du Gouvernement de chaque pays de l'Union de ne pas effectuer sur son territoire le transport et la distribution des objets désignés dans le présent article, à l'égard desquels il n'aurait pas été satisfait aux lois, ordonnances et décrets qui règlent les conditions de leur publication et de leur circulation.

ARTICLE V.

Les objets désignés dans l'article 2 pourront être expédiés sous recommandation.

stitched or bound books, pamphlets, music, visiting cards, catalogues, prospectuses, announcements and notices of various kinds, whether printed, engraved, lithographed, or autographed, as well as for photographs, is fixed at 7 centimes for each single packet.

Nevertheless, as a measure of conversion, the option is reserved to each country, in order to suit its monetary or other requirements, of levying a rate higher or lower than this charge, provided that it does not exceed 11 centimes or go below 5 centimes.

Every packet which does not exceed 50 grammes in weight shall be considered a single packet. The charge upon packets exceeding that weight shall be a single rate for every 50 grammes or fraction of 50 grammes.*

For all conveyance by sea of more than 300 nautical miles within the district of the Union, there may be joined to the ordinary postage an additional charge which shall not exceed the half of the general Union rate fixed for articles of this class.

The maximum weight of the articles mentioned above is fixed at 250 grammes for patterns of merchandise, and at 1000 grammes for all the others.

There is reserved to the Government of each country of the Union the right to refuse to convey over its territory or to deliver articles specified in the present Article with regard to which the laws, orders, and decrees which regulate the conditions of their publication and circulation have not been observed.

ARTICLE V.

The articles specified in Article II. may be registered.

* By Article 24 of the Detailed Regulations for carrying this Treaty into effect, any country which has not adopted the decimal metrical system of weight may substitute *two* ounces for 50 grammes, and may raise to four ounces the weight to be allowed for a *single* newspaper.

nvoi recommandé doit être
.
rt d'affranchissement des
ecommandés est le même
ıi des envois non recom-

ce à percevoir pour la re-
dation et pour les avis de
ı ne devra pas dépasser
ıise dans le service interne
d'origine.
s de perte d'un envoi re-
dé et sauf le cas de force
il sera payé une indem-
0 francs à l'expéditeur ou,
mande de celui-ci, au des-
, par l'Administration dans
ire ou dans le service mari-
laquelle la perte a eu lieu,
re où la trace de l'objet a
à moins que, d'après la
on de son pays, cette Ad-
tion ne soit pas responsable
erte d'envois recommandés
eur.
ement de cette indemnité
ı dans le plus bref délai
et, au plus tard, dans le
n an, à partir du jour de
ıation.
éclamation d'indemnité est
, si elle n'a pas été formulée
délai d'un an, à partir de la
la poste de l'envoi recom-

ARTICLE VI.

nchissement de tout envoi
que ne peut être opéré
oyen de timbres-poste ou
ppes timbrées valables
pays d'origine.
sera pas donné cours aux
et autres imprimés non
is ou insuffisamment af-
. Les autres envois non
is ou insuffisamment affran-
ont taxés comme lettres
nchis, sauf déduction, s'il
le la valeur des enveloppes
ou des timbres-poste em-

ARTICLE VII.

ı port supplémentaire ne
çu pour la réexpédition

Every registered packet must be prepaid.

The postage payable on registered articles is the same as that on articles not registered.

The charge to be made for registration and for return receipts must not exceed that made in the interior service of the country of origin.

In case of the loss of a registered article, except in the case of act of providence, there shall be paid an indemnity of 50 francs to the sender, or, at his request, to the addressee, by the Office of the country in the territory or in the maritime service of which the loss has occurred—that is to say, where the trace of the article has been lost,—unless, according to the legislation of such country, the Office is not responsible for the loss of registered articles sent through its interior post.

The payment of this indemnity shall be effected with the least possible delay, and, at the latest, within a year dating from the date of application.

All claim for an indemnity is excluded if it be not made within one year, counting from the date on which the registered article was posted.

ARTICLE VI.

Prepayment of postage on every description of article can be effected only by means of postage-stamps or stamped envelopes valid in the country of origin.

Newspapers and other printed papers unpaid or insufficiently paid shall not be forwarded. Other articles when unpaid or insufficiently paid shall be charged as unpaid letters, after deducting the value of the stamped envelopes or postage stamps (if any) employed.

ARTICLE VII.

No additional postage shall be charged for the re-transmission of

d'envois postaux dans l'intérieur de l'Union.

Seulement, dans le cas où un envoi du service interne de l'un des pays de l'Union entrerait, par suite d'une réexpédition, dans le service d'une autre pays de l'Union, l'Administration du lieu de destination ajoutera sa taxe interne.

postal articles within the interior of the Union.

But in case an article which has only passed through the interior service of one of the countries of the Union should, by being re-directed, enter into the service of another country of the Union, the Post Office of the country of destination shall add its interior rate.

ARTICLE VIII.

Les correspondances officielles relatives au service des postes sont exemptes du port. Sauf cette exception, il n'est admis ni franchise, ni modération de port.

ARTICLE VIII.

Official correspondence relative to the postal service is exempt from postage. With this exception, no franking or reduction of postage is allowed.

ARTICLE IX.

Chaque Administration gardera en entier les sommes qu'elle aura perçues en vertu des articles 3, 4, 5, 6 et 7 ci-dessus. En conséquence, il n'y aura pas lieu de ce chef à un décompte entre les diverses Administrations de l'Union.

Les lettres et les autres envois postaux ne pourront, dans le pays d'origine comme dans celui de destination, être frappés à la charge des expéditeurs ou des destinataires, d'aucune taxe ni d'aucun droit postal autres que ceux prévus par les articles sus-mentionnés.

ARTICLE IX.

Each Office shall keep the whole of the sums which it collects by virtue of the foregoing Articles 3, 4, 5, 6, and 7. Consequently, there will be no necessity on this head for any accounts between the several Offices of the Union.

Neither the senders nor the addressees of letters and other postal packets shall be called upon to pay, either in the country of origin or in that of destination, any tax or duty other than those contemplated by the Articles above mentioned.

ARTICLE X.

La liberté du transit est garantie dans le territoire entier de l'Union.

En conséquence, il y aura pleine et entière liberté d'échange, les diverses Administrations postales de l'Union pouvant s'expédier réciproquement, en transit par les pays intermédiaires, tant des dépêches closes que des correspondances à découvert, suivant les besoins du trafic et les convenances du service postal.

Les dépêches closes et les correspondances à découvert doivent toujours être dirigées par les voies

ARTICLE X.

The right of transit is guaranteed throughout the entire territory of the Union.

Consequently, there shall be full and entire liberty of exchange, the several Post Offices of the Union being able to send reciprocally, in transit through intermediate countries, closed mails as well as correspondence in open mails, according to the wants of the traffic and the exigencies of the postal service.

Closed mails and correspondence sent in open mails must always be forwarded by the most rapid routes

rapides dont les Adminis-
s postales disposent.
ue plusieurs routes présen-
mêmes conditions de célé-
Administration expéditrice
ix de la route à suivre.
obligatoire d'expédier en
s closes toutes les fois que
re des lettres et autres en-
taux est de nature à entra-
opérations du bureau réex-
r, d'après les déclarations
ministration intéressée.
ce expéditeur paiera à l'Ad-
ation du territoire de transit
nification de 2 francs par
nme pour les lettres et de
imes par kilogramme pour
ois spécifiés à l'art. 4, poids
que le transit ait lieu en
s closes, soit qu'il se fasse
vert.
bonification peut être por-
francs pour les lettres et à
mes pour les envois spécifiés
, lorsqu'il s'agit d'un transit
de 750 kilomètres sur le ter-
l'une même Administration.

entendu toutefois que par-
le transit est déjà actuelle-
ratuit ou soumis à des taxes
levées, ces conditions seront
nues.
les cas où le transit aurait
r mer sur un parcours de
300 milles marins dans le
de l'Union, l'Administra-
r les soins de laquelle ce
maritime est organisé aura
la bonification des frais de
sport.
membres de l'Union s'enga-
réduire ces frais dans la me-
possible. La bonification
ffice qui pourvoit au trans-
aritime pourra réclamer de
de l'Office expéditeur ne
as dépasser 6 francs 50 cen-
ar kilogramme pour les let-
50 centimes par kilogramme
s envois specifiés à l'article
ls net).
aucun cas ces frais ne pour-
re supérieurs à ceux bonifiés
ant. En conséquence, il ne

at the command of the Post Offices concerned.

When several routes offer the same advantages of speed, the despatching Office shall have the right of choosing the route to be adopted.

It is obligatory to make up closed mails whenever the number of letters and other postal packets is of a nature to hinder the operations of the transit office, according to the declaration of the Office interested.

The despatching Office shall pay to the Office of the territory providing the transit, the sum of two francs per kilogramme for letters and 25 centimes per kilogramme for the several articles specified in Article IV., net weight, whether the transit takes place in closed mails or in open mails.

This payment may be increased to 4 francs for letters and to 50 centimes for the articles specified in Article IV., when a transit is provided of more than 750 kilometres in length over the territory of one Office.

It is understood, however, that in any case in which the transit is already actually gratuitous or subject to lower rates, those conditions shall be maintained.

Whenever a transit shall take place by sea over a distance exceeding 300 nautical miles within the district of the Union, the Office by or at the expense of which this sea-service is performed shall have the right to a payment of the expenses attending this transport.

The members of the Union engage to reduce those expenses as much as possible. The payment which the Office providing the sea-conveyance may claim on this account from the despatching Office shall not exceed 6 francs 50 centimes per kilogramme for letters, and 50 centimes per kilogramme for the articles specified in Articles IV., (net weight.)

In no case shall these expenses be higher than those now paid. Consequently, no payment shall be

sera payé aucune bonification sur les routes postales maritimes où il n'en est pas payé actuellement.

Pour établir le poids des correspondances transitant, soit en dépêches closes, soit à découvert, il sera fait à des époques qui seront déterminées d'un commun accord une statistique de ces envois pendant deux semaines. Jusqu'à révision, le résultat de ce travail servira de base aux comptes des Administrations entre elles.

Chaque Office pourra demander la révision:

1° En cas de modification importante dans le cours des correspondances;

2° A l'expiration d'une année après la date de la dernière constatation.

Les dispositions du présent article ne sont pas applicables à la Malle des Indes, ni aux transports à effectuer à travers le territoire des Etats-Unis d'Amérique par les chemins de fer entre New-York et San-Francisco. Ces services continueront à faire l'objet d'arrangements particuliers entre les Administrations intéressées.

made upon the sea routes on which nothing is paid at the present time.

In order to ascertain the weight of the correspondence forwarded in transit, whether in closed mails or in open mails, there shall be taken, at periods which shall be determined upon by common consent, an account of such correspondence during two weeks. Until revised, the result of that account shall serve as the basis of the accounts of the Post Offices between themselves.

Each Office may demand a revision,—

1. In case of any important modification in the direction of the correspondence;

2. At the expiration of a year after the date of the last account.

The provisions of the present Article are not applicable to the Indian mail, nor to the mails conveyed across the territory of the United States of America by the railways between New York and San Francisco. Those services shall continue to form the object of special arrangements between the Post Offices concerned.

ARTICLE XI.

Les relations des pays de l'Union avec des pays étrangers à celle-ci seront régies par les conventions particulières qui existent actuellement ou qui seront conclues entre eux.

Les taxes à percevoir pour le transport au-delà des limites de l'Union seront déterminées par ces conventions; elles seront ajoutées, le cas échéant, à la taxe de l'Union.

En conformité des dispositions de l'article 9, la taxe de l'Union sera attribuée de la manière suivante:

1° L'Office expéditeur de l'Union gardera en entier la taxe de l'Union pour les correspondances affranchies à destination des pays étrangers.

ARTICLE XI.

The relations of the countries of the Union with countries foreign to the Union shall be regulated by the separate conventions which now exist or which may be concluded between them.

The rates of postage chargeable for the conveyance beyond the limits of the Union shall be determined by those conventions; they shall be added, in such case, to the Union rate.

In conformity with the stipulations of Article IX., the Union rate shall be apportioned in the following manner:

1. The despatching Office of the Union shall keep the whole of the Union rate for the prepaid correspondence addressed to foreign countries.

Office destinataire de l'Union
a en entier la taxe de l'Union
es correspondances non af-
ies originaires des pays
ers.
'Office de l'Union qui échange
pêches closes avec des pays
ers gardera en entier la taxe
ıion pour les correspondances
›hies originaires des pays
ers et pour les correspon-
ı non affranchies à destina-
›s pays étrangers.
s les cas désignés sous les
2 et 3, l'Office qui échange
pêches n'a droit à aucune
ation pour le transit. Dans
es autres cas, les frais de
; seront payés d'après les dis-
›ns de l'art. 10.

ARTICLE XII.

ervice des lettres avec valeur
ée et celui des mandats de
feront l'objet d'arrangements
urs entre les divers pays ou
›s de pays de l'Union.

ARTICLE XIII.

Administrations postales des
pays qui composent l'Union
ompétentes pour arrêter d'un
ın accord, dans un règle-
toutes les mesures d'ordre et
tail nécessaires en vue de
ıtion du présent traité. Il
tendu que les dispositions de
lement pourront toujours être
ées d'un commun accord entre
ministrations de l'Union.

différentes Administrations
nt prendre entre elles les ar-
nents nécessaires au sujet
estions qui ne concernent pas
nble de l'Union, comme le
ıent des rapports à la fron-
la fixation de rayons limitro-
ıvec taxe réduite, les condi-
de l'échange des mandats de
et des lettres avec valeur
ée, etc. etc.

2. The receiving Office of the Union shall keep the whole of the Union rate for the unpaid correspondence originating in foreign countries.

3. The Office of the Union which exchanges closed mails with foreign countries shall keep the whole of the Union rate for the paid correspondence originating in foreign countries and for the unpaid correspondence addressed to foreign countries.

In the cases mentioned under the numbers 1, 2, and 3, the Office which exchanges the mails is not entitled to any payment for transit. In all the other cases the transit rates shall be paid according to the stipulations of Article X.

ARTICLE XII.

The exchange of letters with value declared and of Post Office money orders shall form the subject of ulterior arrangements between the various countries or groups of countries composing the Union.

ARTICLE XIII.

The Post Offices of the various countries composing the Union are competent to draw up, by common consent, in the form of detailed regulations, all the measures of order and detail necessary with a view to the execution of the present treaty. It is understood that the stipulations of these detailed regulations may always be modified by the common consent of the Offices of the Union.

The several Offices may make amongst themselves the necessary arrangements on the subject of questions which do not concern the Union generally; such as the regulations of exchange at the frontier, the determination of radii in adjacent countries within which a lower rate of postage may be taken, the conditions of the exchange of Post Office money orders, and of letters with declared value, &c., &c.

ARTICLE XIV.

Les stipulations du présent traité ne portent ni altération à la législation postale interne de chaque pays, ni restriction au droit des parties contractantes de maintenir et de conclure des traités, ainsi que de maintenir et d'établir des unions plus restreintes en vue d'une amélioration progressive des relations postales.

ARTICLE XV.

Il sera organisé, sous le nom de Bureau international de l'Union générale des postes, un office central qui fonctionnera sous la haute surveillance d'une Administration postale désignée par le Congrès, et dont les frais seront supportés par toutes les Administrations des Etats contractants.

Ce bureau sera chargé de coordonner, de publier et de distribuer les renseignements de toute nature qui intéressent le service international des postes, d'émettre, à la demande des parties en cause, un avis sur les questions litigieuses, d'instruire les demandes de modification au règlement d'exécution, de notifier les changements adoptés, de faciliter les opérations de la comptabilité internationale, notamment dans les relations prévues à l'art. 10 ci-dessus et, en général, de procéder aux études et aux travaux dont il serait saisi dans l'intérêt de l'Union postale.

ARTICLE XVI.

En cas de dissentiment entre deux ou plusieurs membres de l'Union relativement à l'interprétation du présent traité, la question en litige devra être réglée par jugement arbitral; à cet effet, chacune des Administrations en cause choisira un autre membre de l'Union qui ne soit pas intéressé dans l'affaire.

La décision des arbitres sera

ARTICLE XIV.

The stipulations of the present treaty do not involve any alteration in the interior postal legislation of any country, nor any restriction on the right of the contracting parties to maintain and to conclude treaties, as well as to maintain and establish more restricted unions with a view to a progressive improvement of postal relations.

ARTICLE XV.

There shall be organized, under the name of the International Office of the General Postal Union, a central office, which shall be conducted under the surveillance of a Postal Administration to be chosen by the Congress, and the expenses of which shall be borne by all the Offices of the contracting States.

This office shall be charged with the duty of collecting, publishing, and distributing information of every kind which concerns the international postal service; of giving, at the request of the parties concerned, an opinion upon questions in dispute; of making known proposals for modifying the detailed regulations; of notifying alterations adopted; of facilitating operations relating to international accounts, especially in the cases referred to in Article X. foregoing; and in general of considering and working out all questions in the interest of the Postal Union.

ARTICLE XVI.

In case of disagreement between two or more members of the Union as to the interpretation of the present treaty, the question in dispute shall be decided by arbitration. To that end, each of the Offices concerned shall choose another member of the Union not interested in the affair.

The decision of the arbitrators

ée à la majorité absolue des

cas de partage des voix, les
res choisiront, pour trancher
férend, une autre Administra-
également désintéressée dans
ge.

ARTICLE XVII.

ntrée dans l'Union des pays
re-mer n'en faisant pas encore
e sera admise aux conditions
ntes:
Ils déposeront leur déclara-
ntre les mains de l'Adminis-
n chargée de la gestion du
au international de l'Union.
Ils se soumettront aux stipu-
is du traité de l'Union, sauf
te ultérieure au sujet des frais
nsport maritime.

Leur adhésion à l'Union doit
précédée d'une entente entre
dministrations ayant des con-
ons postales ou des relations
tes avec eux.
Pour amener cette entente,
inistration gérante convo-
, le cas échéant, une réunion
dministrations intéressées et
Administration qui demande
s.

L'entente établie, l'Adminis-
n gérante en avisera tous les
res de l'Union générale des
s.

i dans un délai de six semaines,
tir de la date de cette com-
cation, des objections ne sont
résentées, l'adhésion sera con-
e comme accomplie et il en
fait communication par l'Ad-
tration gérante à l'Adminis-
n adhérente.—L'adhésion dé-
e sera constatée par un acte
natique entre le Gouverne-
de l'Administration gérante
Gouvernement de l'Adminis-
n admise dans l'Union.

shall be given by an absolute majority of votes.

In case of an equality of votes the arbitrators shall choose, with the view of settling the difference, another Administration equally uninterested in the question in dispute.

ARTICLE XVII.

The entry into the Union of countries beyond sea not yet forming part of it, shall be effected on the following conditions:—

1. They shall make their application to the Administration charged with the management of the International Office of the Union.

2. They shall submit to the stipulations of the treaty of the Union, subject to an ulterior understanding on the subject of the cost of sea conveyance.

3. Their adhesion to the Union must be preceded by an understanding between the Administrations having postal conventions or direct relations with them.

4. In order to bring about this understanding, the Administration charged with the management of the International Office of the Union shall convene, if there be occasion, a meeting of the Administrations interested, and of the Administration desiring admission.

5. When the understanding has been arrived at, the Administration charged with the management of the International Office of the Union shall give notice of the same to all the members of the General Postal Union.

6. If in a period of six weeks, counting from the date of that communication, no objections are presented, the adhesion shall be considered as accomplished, and notice thereof shall be given by the managing Administration to the Administration joining the Union. The definitive adhesion shall be completed by a diplomatic act between the Government of the managing Administration and the Government of the Administration admitted into the Union.

ARTICLE XVIII.

Tous les trois ans au moins, un Congrès de plénipotentiaires des pays participant au traité sera réuni en vu de perfectionner le système de l'Union, d'y introduire les améliorations jugées nécessaires et de discuter les affaires communes.

Chaque pays a une voix.

Chaque pays peut se faire représenter, soit par un ou par plusieurs délégués, soit par la délégation d'un autre pays.

Toutefois, il est entendu que le délégué ou les délégués d'un pays ne pourront être chargés que de la représentation de deux pays, y compris celui qu'ils représentent.

La prochaine réunion aura lieu à Paris en 1877.

Toutefois, l'époque de cette réunion sera avancée, si la demande en est faite par le tiers au moins des membres de l'Union.

ARTICLE XIX.

Le présent traité entrera en vigueur le 1er juillet 1875.

Il est conclu pour trois ans à partir de cette date. Passé ce terme, il sera considéré comme indéfiniment prolongé, mais chaque partie contractante aura le droit de se retirer de l'Union, moyennant un avertissement donné une année à l'avance.

ARTICLE XX.

Sont abrogées, à partir du jour de la mise à exécution du présent traité, toutes les dispositions des traités spéciaux conclus entre les divers pays et Administrations, pour autant qu'elles ne seraient pas conciliables avec les termes du présent traité et sans préjudice des dispositions de l'art. 14.

Le présent traité sera ratifié aussitôt que faire se pourra et, au

ARTICLE XVIII.

Every three years at least a Congress of plenipotentiaries of the countries participating in the treaty shall be held with a view of perfecting the system of the Union, of introducing into it improvements found necessary, and of discussing common affairs.

Each country has one vote.

Each country may be represented either by one or several delegates, or by the delegation of another country.

Nevertheless, it is understood that the delegate or delegates of one country can be charged with the representation of two countries only, including the one they represent.

The next meeting shall take place at Paris, in 1877.

Nevertheless, the period of this meeting may be advanced, if a demand to that effect be made by one third at least of the members of the Union.

ARTICLE XIX.

The present treaty shall come into force on the 1st of July, 1875.

It is concluded for three years from that date. When that term is passed, it shall be considered as indefinitely prolonged, but each contracting party will have the right to withdraw from the Union on giving notice one year in advance.

ARTICLE XX.

After the date on which the present treaty comes into effect, all the stipulations of the special treaties concluded between the various countries and Administrations, in so far as they may be at variance with the terms of the present treaty, and without prejudice to the stipulations of Article XIV., are abrogated.

The present treaty shall be ratified as soon as possible, and, at the

plus tard, trois mois avant la date de sa mise à exécution. Les actes de ratification seront échangés à Berne.

En foi de quoi les plénipotentiaires des Gouvernements des pays ci-dessus énumérés l'ont signé à Berne, le 9 Octobre, 1874.

Pour les Etats-Unis d'Amérique:
JOSEPH H. BLACKFAN.

Pour l'Allemagne:
STEPHAN.
GÜNTHER.

Pour l'Autriche:
LE BARON DE KOLBENSTEINER.
PILHAL.

Pour la Hongrie:
M. GERVAY.
P. HEIM.

Pour la Belgique:
FASSIAUX.
VINCHENT.
J. GIFE.

Pour le Danemark:
FENGER.

Pour l'Egypte.
MUZZI BEY.

Pour l'Espagne:
ANGEL MANSI.
EMILIO C. DE NAVASQÜES.

Pour la France: (3 mai 1875,)
B. D'HARCOURT.

Pour la Grande-Bretagne:
WM. JAS. PAGE.

Pour la Grèce:
A. MANSOLAS.
A. H. BÉTANT.

Pour l'Italie;
TANTESIO.

Pour le Luxembourg:
VON ROEBE.

Pour la Norvège:
C. OPPEN.

Pour les Pays-Bas:
HOFSTEDE.
B. SWEERTS DE LANDAS WYBORGH.

Pour le Portugal:
EDUARDO LESSA.

Pour la Roumanie:
GEORGE F. LAHOVARI.

latest, three months previous to the date on which it is to come into force. The acts of ratification shall be exchanged at Berne.

In faith of which the plenipotentiaries of the Governments of the countries above enumerated have signed it at Berne, the 9th October, 1874.

For the United States of America:
JOSEPH H. BLACKFAN.

For Germany:
STEPHAN.
GÜNTHER.

For Austria:
LE BARON DE KOLBENSTEINER.
PILHAL.

For Hungary:
M. GERVAY.
P. HEIM.

For Belgium:
FASSIAUX.
VINCHENT.
J. GIFE.

For Denmark:
FENGER.

For Egypt:
MUZZI BEY.

For Spain:
ANGEL MANSI.
EMILIO C. DE NAVASQÜES.

For France: (May 3, 1875,)
B. D'HARCOURT.

For Great Britain:
WM. JAS. PAGE.

For Greece:
A. MANSOLAS.
A. H. BÉTANT.

For Italy:
TANTESIO.

For Luxemburg:
VON ROEBE.

For Norway:
C. OPPEN.

For the Netherlands:
HOFSTEDE.
B. SWEERTS DE LANDAS WYBORGH.

For Portugal:
EDUARDO LESSA.

For Roumania:
GEORGE F. LAHOVARI.

Pour la Russie:
BARON VELHO.
GEORGES POGGENPOHL.
Pour la Serbie:
MLADEN Z. RADOJKOVITCH.
Pour la Suède:
W. ROOS.
Pour la Suisse:
EUGÈNE BOREL.
NAEFF.
DR. J. HEER.
Pour la Turquie:
YANCO MACRIDI.

For Russia:
BARON VELHO.
GEORGES POGGENPOHL.
For Servia:
MLADEN Z. RADOJKOVITCH.
For Sweden:
W. ROOS.
For Switzerland:
EUGÈNE BOREL.
NAEFF.
DR. J. HEER.
For Turkey:
YANCO MACRIDI.

Having examined and considered the provisions of the Treaty concerning the formation of a General Postal Union signed at Berne, Switzerland, on the 9th of October, A. D. 1874, a certified copy of which is hereunto annexed, the same is by me, in virtue of the powers vested in the Postmaster-General by law, hereby ratified and approved, by and with the advice and consent of the President of the United States.

In witness whereof I have caused the seal of the Post-Office Department of the United States to be hereto affixed with my signature this eighth day of March, 1875.

[SEAL.]

MARSHALL JEWELL,
Postmaster General.

I hereby approve the above-mentioned Treaty, and in testimony thereof I have caused the seal of the United States to be affixed hereto.

[SEAL.] U. S. GRANT.

By the President:
HAMILTON FISH,
Secretary of State.
WASHINGTON, *March* 8, 1875.

Protocole Final Relatif au Traité.

Les soussignés plenipotentiaires des Gouvernements des pays qui ont signé aujourd'hui le traité concernant la création d'une Union générale des Postes, sont convenus de ce qui suit:

Dans le cas où le Gouvernement français, qui s'est réservé le protocole ouvert et qui figure en conséquence au nombre des parties contractantes au traité sans y avoir encore donné son adhésion, ne se déciderait pas à le signer, ce traité n'en sera pas moins définitif et obligatoire pour toutes les autres parties contractantes dont les représentants l'ont signé aujourd'hui.

Final Protocol Relative to the Treaty.

The undersigned plenipotentiaries of the Governments of the countries which have to-day signed the treaty concerning the formation of a General Postal Union, have agreed as follows:

In case the French Government, which has reserved to itself the open protocol, and which appears in consequence in the number of the contracting parties to the treaty without having yet given to it, its adherence, should decide not to sign it, this treaty shall be no less definitive and obligatory for all the other contracting parties whose representatives have signed it to-day.

oi de quoi les plénipotenti-
ci-dessous ont dressé le pré-
rotocole final qui aura la
force et la même valeur que
dispositions qu'il contient
insérées dans le traité lui-
et ils l'ont signé en un
laire qui restera déposé aux
es du Gouvernement de la
lération Suisse et dont une
era remise à chaque partie.
ie, Octobre 9, 1874.

: l'Allemagne:
AN.
IER.
: l'Autriche:
RON DE KOLBENSTEINER.
L.
: la Hongrie:
RVAY.
M.
: la Belgique:
UX.
ENT.
E.
: le Danemark:
R.
l'Egypte:
BEY.
l'Espagne:
MANSI.
C. DE NAVASQÜES.
les Etats-Unis d'Amérique:
H H. BLACKFAN.
la Grande-Bretagne:
PAGE.
la Grèce:
NSOLAS.
BÉTANT.
l'Italie:
SIO.
le Luxembourg:
ROEBE.
la Norvège:
EN.
les Pays-Bas:
EDE.
EERTS DE LANDAS WY-
GH.
le Portugal:
DO LESSA.

In faith of which the undersigned plenipotentiaries have prepared the present protocol, which shall have the same force and value as if the provisions it contains were inserted in the treaty itself, and they have signed one copy of it which shall remain in the archives of the Government of the Swiss Confederation, and a copy of which shall be given to each party.

Berne, October 9, 1874.

For Germany:
STEPHAN.
GÜNTHER.
For Austria:
LE BARON DE KOLBENSTEINER.
PILHAL.
For Hungary:
M. GERVAY.
P. HEIM.
For Belgium:
FASSIAUX.
VINCHENT.
J. GIFE.
For Denmark:
FENGER.
For Egypt:
MUZZI BEY.
For Spain:
ANGEL MANSI.
EMILIO C. DE NAVASQÜES.
For the United States of America:
JOSEPH H. BLACKFAN.
For Great Britain:
W. J. PAGE.
For Greece:
A. MANSOLAS.
A. H. BÉTANT.
For Italy:
TANTESIO.
For Luxemburg:
V. DE ROEBE.
For Norway:
C. OPPEN.
For the Netherlands:
HOFSTEDE.
B. SWEERTS DE LANDAS WYBORGH.
For Portugal:
EDUARDO LESSA.

Pour la Roumanie:
GEORGE F. LAHOVARI.
Pour la Russie:
BARON VELHO.
GEORGES POGGENPOHL.
Pour la Serbie:
MLADEN Z. RADOJKOVITCH.
Pour la Suède:
W. ROOS.
Pour la Suisse:
EUGÈNE BOREL.
NAEFF.
DR. J. HEER.
Pour la Turquie:
YANCO MACRIDI.

For Roumania:
GEORGE F. LAHOVARI.
For Russia:
BARON VELHO.
GEORGES POGGENPOHL.
For Servia:
MLADEN Z. RADOJKOVITCH.
For Sweden:
W. ROOS.
For Switzerland:
EUGÈNE BOREL.
NAEFF.
DR. J. HEER.
For Turkey:
YANCO MACRIDI.

Having examined and considered the final protocol relative to the Treaty concerning the formation of a General Postal Union, signed at Berne, October 9, 1874, the same is by me, in virtue of the powers vested in the Postmaster-General by law, hereby ratified and approved, by and with the advice and consent of the President of the United States.

In witness whereof I have caused the seal of the Post-Office Department of the United States to be hereto affixed with my signature this 21st day of May, 1875.

[SEAL.] MARSHALL JEWELL,
Postmaster-General.

I hereby approve the above-mentioned protocol, and in testimony thereof I have caused the seal of the United States to be affixed.

[SEAL.] U. S. GRANT.

By the President:
HAMILTON FISH,
Secretary of State.

WASHINGTON, *May* 21, 1875.

Le délai pour l'échange des ratifications ayant été prorogé d'un commun accord, les soussignés, plénipotentiaires des Gouvernements des pays qui ont conclu à Berne, le 9 Octobre, 1874, le Traité concernant la création d'une Union générale des Postes, se sont réunis aujourd'hui à Berne pour procéder à l'échange des ratifications de ce Traité.

Le plénipotentiaire du Gouvernement français, Monsieur le comte d'Harcourt, a déclaré que la France donne son adhésion au Traité, sauf approbation de l'Assemblée nationale et moyennant les conditions et réserves suivantes:

1° Cette convention pourra n'entrer en vigueur en ce qui concerne

The delay in the exchange of the ratifications having been prolonged by common consent, the undersigned plenipotentiaries of the Governments of the countries which concluded at Berne, the 9th October, 1874, the Treaty concerning the formation of a general Postal Union, met at Berne this day in order to exchange the ratifications of the said Treaty.

The plenipotentiary of the French Government, M. le comte d'Harcourt, announced that France gives its adhesion to the Treaty, subject to the approval of the National Assembly, upon the following conditions and reservations:

1. This convention shall not enter into effect, so far as France is

ce qu'à partir du 1er Janvier

bonification à payer pour
sit territorial sera réglée
le parcours réel;

ne pourra être apporté au-
odification en ce qui touche
fs inscrits dans le Traité du
bre 1874 si ce n'est à l'una-
des voix des pays de l'Union
ntés au Congrès.

ertu des pouvoirs spéciaux
r ont été donnés à cet effet et
se sont communiqués, les
tentiaires soussignés ont
, au nom de leurs Gouverne-
respectifs, consentir les con-
et réserves Nos 1 et 3 ci-des-

serve sous N° 2 a également
nsentie, avec la rédaction
te, proposée par le Gouverne-
usse et à laquelle Monsieur
te d'Harcourt, au nom du
nement français, a déclaré
er:
La bonification à payer pour
sit territorial sera réglée
le parcours réel, mais aux
taxes que celles établies par
ité constitutif de l'Union
le des Postes."

s ces préliminaires, le Traité
Berne le 9 Octobre 1874 a
plété par l'apposition de la
ire du délégué de la France,
exemplaire original revêtu
natures de toutes parties en
remis, séance tenante, au
tentiaire de chacun des 22
ui composent l'Union.

il a été procédé à l'examen
ctes de ratification. Les
nents des actes de ratifica-
e tous les pays dont les
és ont signé le Traité, à Berne
ctobre 1874, savoir de l'Alle-
, de l'Autriche-Hongrie, de
lgique, du Danemark, de
te, de l'Espagne, des Etats-
d'Amérique, de la Grande-
ne, de la Grèce, de l'Italie,
xembourg, des Pays-Bas, du

concerned, until the 1st of January, 1876;

2. The compensation to be paid for territorial transit shall be adjusted according to the actual route traversed;

3. There shall be no modification made in relation to the tariffs established in the Treaty of the 9th October, 1874, except by the unanimous vote of the countries of the Union represented at the Congress.

By virtue of the special powers given them for the purpose and which they have communicated, the undersigned plenipotentiaries have announced, in the name of their respective Governments, their assent to the conditions and reservations Nos. 1 and 3 above.

The reservation under No. 2 was also agreed to, with the following wording, proposed by the Government of Russia and accepted in the name of the French Government by M. le comte d'Harcourt:

"2d. The compensation to be paid for territorial transit shall be adjusted according to the actual route traversed, but at the same rates as those established by the Treaty constituting the general Postal Union."

After these preliminaries, the Treaty signed at Berne, October 9, 1874, was completed by apposition of the signature of the delegate of France, and an original copy bearing the signature of all the parties was presented pending the session, to the plenipotentiary of each of the 22 countries which form the Union.

The acts of ratification were then examined. The instruments of the acts of ratification of all the countries, the delegates from which signed the Treaty at Berne, the 9th October, 1874, viz: Germany, Austria-Hungary, Belgium, Denmark, Egypt, Spain, the United States of America, Great Britain, Greece, Italy, Luxemburg, the Netherlands, Portugal, Roumania, Russia, Servia, Sweden and Norway, Switzer-

Portugal, de la Roumanie, de la Russie, de la Serbie, de la Suède et de la Norvège, de la Suisse et de la Turquie, ont été trouvés en bonne et dûe forme, et, conformément à ce qui a été convenu entre tous les hauts Gouvernements contractants, ils demeureront déposés dans les archives de la Confédération suisse.

En ce qui concerne l'acte de ratification de la France, qui ne pourra être déposé qu'après que le Traité aura reçu l'approbation de l'Assemblée nationale, il a été convenu, d'un commun accord, que cet acte sera reçu par le Conseil fédéral suisse qui donnera avis de cette remise aux autres parties contractantes.

En foi de quoi, les soussignés ont dressé le présent procès-verbal qu'ils ont revêtu de leurs signatures.

Fait à Berne, le 3 Mai, 1875, en 21 expeditions, dont une restera déposée dans les archives de la Confédération suisse, pour accompagner les instruments des actes de ratification.

Pour les Etats-Unis d'Amérique:
HORACE RUBLEE.

Pour l'Allemagne:
GÉNÉRAL DE ROEDER.

Pour l'Autriche et la Hongrie:
OTTENFELS.

Pour la Belgique:
HUBERT DOLEZ.

Pour le Danemark:
GALIFFE.

Pour l'Egypte:
MUZZI BEY.

Pour l'Espagne:
LE VICOMPTE DE MANZANERA.

Pour la France:
B. D'HARCOURT.

Pour la Grande-Bretagne:
ALAN MACLEAN.

Pour la Grèce:
A. H. BÉTANT.

Pour l'Italie:
MELEGARI.

land, and Turkey, were found in good and due form, and in conformity to the agreement between all the high contracting Governments they will remain deposited in the archives of the Swiss Confederation.

In relation to the act of ratification of France, which can only be deposited after the Treaty has received the approval of the National Assembly, it was agreed by common consent, that this act shall be received by the Swiss Federal Council, which shall give notice of its remission to the other contracting parties.

In testimony of which the undersigned have prepared the present procès-verbal, and have appended their signatures thereto.

Done at Berne, the 3d May, 1875, in 21 copies, one of which shall remain placed in the archives of the Swiss Confederation, to accompany the instruments of the acts of ratification.

For the United States of America:
HORACE RUBLEE.

For Germany:
GÉNÉRAL DE ROEDER.

For Austria and Hungary:
OTTENFELS.

For Belgium:
HUBERT DOLEZ.

For Denmark:
GALIFFE.

For Egypt:
MUZZI BEY.

For Spain:
LE VICOMPTE DE MANZANERA.

For France:
B. D'HARCOURT.

For Great Britain:
ALAN MACLEAN.

For Greece:
A. H. BÉTANT.

For Italy:
MELEGARI.

r le Luxembourg:
ROEBE.
r les Pays-Bas:
SUTER-VERMEULEN.
r le Portugal:
OMTE DAS ALCAÇOVAS D.
Z.
r la Roumanie:
VRANAS.
r la Russie:
ORTCHACOW.
r la Serbie:
KITCH.
r la Suède et la Norvège:
DE SCHAECK.
r la Suisse:
ER.
NE BOREL.
r la Turquie:
MACRIDI.

For Luxemburg:
V. DE ROEBE.
For the Netherlands:
J. G. SUTER-VERMEULEN.
For Portugal:
LE COMTE DAS ALCAÇOVAS D. LUIZ.
For Roumania:
CTE. VRANAS.
For Russia:
M. GORTCHACOW.
For Servia:
R. ZUKITCH.
For Sweden and Norway:
A. M. DE SCHAECK.
For Switzerland:
SCHERER.
EUGÈNE BOREL.
For Turkey:
YANCO MACRIDI.

DETAILED REGULATIONS FOR THE EXECUTION OF THE TREATY CONCERNING THE FORMATION OF A GENERAL POSTAL UNION, CONCLUDED AT BERNE, OCTOBER 9, 1874.

[These Detailed Regulations, as signed, were in the French language only. The English translation has been added in Washington.]

RÈGLEMENT DE DÉTAIL ET D'ORDRE pour l'exécution du traité concernant la création d'une Union générale des Postes, conclu à Berne, le 9 Octobre 1874.

Les soussignés, vu l'article 13 du traité concernant la création d'une Union générale des Postes, du 9 Octobre 1874, ont, au nom de leurs Administrations respectives, arrêté d'un common accord les mesures suivantes, pour assurer l'exécution du dit traité :

I.

Taxes des correspondances dans l'Union.

Les Administrations faisant partie de l'Union se communiqueront réciproquement les taxes qu'elles auront adoptées en conformité des articles 3, 4 et 5 du traité pour les lettres affranchies et non affranchies et pour les autres objets affranchis originaires et à destination de l'Union, ainsi que les prix de transport applicables aux services territoriaux et maritimes de l'intérieur de l'Union, en vertu des § § 6, 7, 9 et 10 de l'art. 10 du traité. Toute modification apportée ultérieurement dans la fixation de ces taxes ou prix devra être notifiée sans retard.

II.

Echange en dépêches closes.

L'échange des correspondances en dépêches closes entre les Administrations de l'Union sera réglé d'un commun accord et selon les nécessités du service entre les Ad-

DETAILED REGULATIONS for the execution of the Treaty concerning the formation of a General Postal Union, concluded at Berne, the 9th October, 1874.

The undersigned, with reference to Art. 13 of the Treaty of the 9th October, 1874, concerning the formation of a General Postal Union, have, in the name of their respective Offices, by common consent, agreed upon the following measures for ensuring the execution of the said treaty :

I.

Rates of postage within the Union.

The Post Offices composing the Union shall communicate reciprocally the rates of postage which they shall have adopted in conformity with Articles 3, 4, and 5 of the Treaty, for paid and unpaid letters, and for the other paid articles originating in and addressed to the Union, as well as the transit rates applicable to the land and sea services within the Union, by virtue of paragraphs 6, 7, 9, and 10 of Article 10 of the Treaty. Every modification adopted hereafter in the amount of those rates shall be notified without delay.

II.

Exchange in closed mails.

The exchange of correspondence in closed mails between the Post Offices of the Union shall be regulated by common consent and according to the necessities of the

rations en cause. S'il s'agit
:hange à faire par l'entremise
ɔu de plusieurs pays tiers,
dministrations de ces pays
ıt en être prévenues en temps
un.

III.

Application des timbres.

s correspondances à échanger
ɔquement seront frappées à
ie supérieure de la suscrip-
'un timbre indiquant le lieu
ne et la date du dépôt à la

es correspondances non af-
ies ou insuffisamment affran-
eront en outre frappées du
"T" (Taxe à payer) dont
:ation incombera à l'office du
'origine.
es objets recommandés por-
'empreinte du timbre spécial
pour les envois de l'espèce
pays d'origine.
es diverses Administrations
nuniqueront, par l'entremise
'eau international, une em-
de ce dernier timbre.

out objet de correspondance
:ant pas le timbre "T" sera
ɔré comme affranchi jusqu'à
.tion et traité en conséquence,
reur évidente.

IV.

cation du nombre de ports.

ɔrsqu'une lettre ou tout autre
e correspondance sera passi-
raison de son poids, de plus
rt simple, l'Office expéditeur
ɔra à l'angle gauche supérieur
ıuscription, en chiffres ordi-
le nombre de ports perçus
ɔrcevoir.
:tte mesure ne sera pas de
pour les correspondances
; affranchies à destination
ys de l'Union.

service between the Post Offices concerned. If an exchange of mails should take place through the medium of one or of several other countries, due notice shall be given to the Post Offices of those countries.

III.

Application of the stamps.

1. The correspondence to be reciprocally exchanged shall be impressed, on the upper part of the address, with a stamp indicating the place of origin and the date of posting.

2. Unpaid or insufficiently paid correspondence shall, in addition, be impressed with the stamp "T" (tax to be paid), the application of which shall devolve upon the office of the country of origin.

3. Registered articles shall bear the impression of the special stamp used for articles of a like nature in the country where they originate.

4. The several Post Offices shall forward to each other, through the medium of the International Office, an impression of the stamp last mentioned.

5. Every postal packet which does not bear the stamp "T" shall be considered as paid to destination and treated accordingly, unless there be an obvious error.

IV.

Indication of the Number of Rates.

1. When a letter or other postal packet shall be liable, by reason of its weight, to more than a single rate of postage, the despatching office shall indicate in the upper left-hand corner of the address, in ordinary figures, the number of rates paid, or to be paid.

2. This regulation shall not be obligatory in the case of correspondence fully prepaid addressed to a country of the Union.

V.

Affranchissement insuffisant.

1) Lorsqu'un objet sera insuffisamment affranchi au moyen de timbres-poste, l'Office expéditeur devra indiquer en chiffres *noirs*, apposés à côté des timbres-poste, la valeur totale de ceux-ci. Cette valeur sera exprimée en francs et centimes.

2) Dans le cas où il aurait été fait usage de timbres-poste non valables dans le pays d'origine, il n'en sera tenu aucun compte. Cette circonstance sera indiquée par le chiffre zéro "0" placé à côté des timbres-poste.

3) L'Office du lieu de destination frappera les objets insuffisamment affranchis du complément de la taxe due, à concurrence du prix d'une lettre non affranchie du même poids. Au besoin on forcera les fractions jusqu'à l'unité monétaire de perception employée dans le pays de destination.

V.

Insufficient Prepayment.

1. When an article shall be insufficiently prepaid by means of postage stamps, the despatching office shall indicate in figures, in black ink, placed by the side of the postage stamps, their total value. That value shall be expressed in francs and centimes.

2. In case postage stamps may be used which are not of any value in the country of origin, no account shall be taken of them. This fact shall be indicated by the figure "0" placed by the side of the postage stamps.

3. The office of the country of destination shall charge the insufficiently paid articles with the amount of the deficient postage, calculated at the rate of an unpaid letter of the same weight. In case of need, fractions may be raised to the monetary unit of charge in force in the country of destination.

VI.

Feuilles d'avis.

1) Les feuilles d'avis pour les échanges directs entre deux Administrations seront conformes au modèle joint au présent règlement, sub lit. A.

2) Il ne sera fait aucune mention dans la feuille d'avis des correspondances de toute nature, affranchies, non affranchies ou insuffisamment affranchies, originaires d'un pays de l'Union et à destination d'un autre de ces pays, non plus que des correspondances affranchies de l'étranger à destination de l'Union ou non affranchies de l'Union à destination de l'étranger.

3) Pour les autres correspondances, on mentionnera:

1° Au tableau N° I le montant total des taxes étrangères sur les correspondances non affranchies et le montant des débours sur les correspondances réexpediées dont il devra être tenu compte à l'Office envoyeur.

VI.

Letter-Bills.

1. The letter bills for the direct exchanges between two Post Offices shall be in conformity with the specimen A. appended to the present regulations.

2. No mention shall be made in the letter bill of the correspondence of any kind, whether paid, unpaid, or insufficiently paid, originating in one country of the Union and addressed to another of those countries, nor of the paid correspondence from foreign countries addressed to the Union, or of the unpaid correspondence from the Union addressed to foreign countries.

3. As regards other correspondence, there shall be entered,—

1st. Under table I., the total amount of the foreign postages due on the unpaid correspondence, and the amount of the claims on the correspondence retransmitted, for which credit will have to be given to the despatching Office.

ıu tableau N° II le montant les taxes et, le cas échéant, roits de recommandation ers, sur les correspondances hies, qui seront à bonifier à destinataire ou de sortie de ı.

es taxes ou débours à in- au tableau N° I seront indi- ur chaque objet au crayon l'angle gauche inférieur de se.

s taxes et droits à porter ıpte au tableau N° II seront s au crayon *rouge* sur chaque à l'angle gauche inférieur de se.

u tableau N° III on inscrira, s détails que ce tableau com- les dépêches closes en tran- ıi accompagnent les envois ı.

es objets recommandés se- ıscrits au tableau N° IV de lle d'avis avec les détails sui- le nom du bureau d'origine, du destinataire et le lieu de ıtion ou seulement le nom reau d'origine et le numéro iption de l'objet à ce bureau, ıtant du port et des droits de nandation étrangers à boni- cas échéant, à l'Office desti- e ou de sortie de l'Union.

orsque le nombre d'objets mandés à expédier habituel- d'un bureau d'échange à un le comportera, il pourra être uit une liste spéciale et dé- pour remplacer le tableau de la feuille d'avis.

Les taxes, bonifications et rs seront exprimés en francs times.

Si, pour faciliter les opéra- le compte, il était jugé néces- dans certaines relations de des rubriques nouvelles aux ux N° I et II de la feuille , la mesure pourra être intro- après une entente entre les nistrations intéressées. Le héant, les modèles de comp- ront mis en rapport avec la ıture des feuilles d'avis.

2nd. Under table II., the total amount of the postages, and, when necessary, the foreign fees for registration, upon the paid correspondence, which will have to be credited to the Office of destination, or to the furthest Office of the Union.

4. The postages or claims to be entered in table I. shall be indicated upon each article, in *blue* ink, at the lower left-hand corner of the address.

5. The postage and fees to be brought to account under table II. shall be indicated on each article, in *red* ink, at the lower left-hand corner of the address.

6. In table III. shall be entered, with such details as this table requires, the closed mails in transit which accompany the direct mails.

7. The registered correspondence shall be entered in table No. IV. of the letter bill, with the following details: the name of the office of origin, the name of the addressee and the place of destination, or simply the name of the office of origin and the number given to the article at that office; the amount of the postage and the foreign registration fees to be credited, when necessary, to the Office of destination or the furthest Office of the Union.

8. When the number of registered articles usually sent from one office of exchange to another shall require it, a special and separate list shall be used to take the place of table No. IV. of the letter bill.

9. The amount of postages, credits, and debits shall be expressed in francs and centimes.

10. If, in order to facilitate operations of account, it should be deemed necessary in certain cases to adopt new articles under tables I. and II. of the letter bill, the necessary steps may be taken after an understanding between the Post Offices concerned. In such case, the forms of accounts shall be made to correspond with the wording of the letter bills.

VII.

Expédition d'objets recommandés.

1) Les objets recommandés seront réunis en un paquet distinct, qui devra être convenablement enveloppé et cacheté de manière à en préserver le contenu.

2) Ce paquet, entouré de la feuille d'avis, sera placé au centre de la dépêche.

VII.

Despatch of registered Correspondence.

1. The registered correspondence shall be enclosed in a separate packet, which must be suitably made up and sealed so as to preserve its contents.

2. This packet, with the letter bill round it, shall be placed in the centre of the mail.

VIII.

Confection des dépêches.

1) Toute dépêche échangée entre des bureaux de l'Union, après avoir été ficelée intérieurement, devra être enveloppée de papier fort en quantité suffisante pour éviter toute détérioration du contenu, puis ficelée extérieurement et cachetée à la cire ou au moyen d'un cachet en papier gommé avec l'empreinte du cachet du bureau. Elle sera munie d'une suscription imprimée portant en petits caractères le nom du bureau expéditeur et en caractères plus forts le nom du bureau destinataire: "de . . . ." "pour . . . ."

2) Si le volume de la dépêche le comporte, elle devra être renfermée dans un sac convenablement fermé et cacheté.

3) Les sacs devront être renvoyés au bureau expéditeur par le prochain courrier.

VIII.

Making up the Mails.

1. Every mail exchanged between offices of the Union, after having been first tied with string, must be enclosed in strong paper of sufficient quantity to prevent damage to the contents, then tied again with string on the outside, and sealed with wax or fastened by means of a gummed paper label bearing an impression of the seal of the office. The mail must be furnished with a printed address bearing in small characters the name of the despatching office, and in larger characters the name of the office to which it is to be forwarded: "From . . . ." "For . . . ."

2. If the size of the mail should require it, it must be enclosed in a bag properly closed and sealed.

3. The bags must be returned to the despatching office by the next mail.

IX.

Vérification des dépêches.

1) Le bureau d'échange qui recevra une dépêche constatera en premier lieu si les inscriptions sur la feuille d'avis (débours, bonifications, dépêches closes en transit, objets recommandés) sont exactes.

2) S'il reconnaît des erreurs ou des omissions, il opère immédiatement les rectifications nécessaires sur les feuilles ou listes, en ayant soin de biffer les indications erronées d'un trait de plume, de manière à pouvoir reconnaître les inscriptions primitives.

IX.

Verification of the Mails.

1. The exchanging office which shall receive a mail shall, in the first place, ascertain whether the entries in the letter bill (debits, credits, closed mails in transit, registered articles) are correct.

2. If it discovers errors or omissions, it shall immediately make the necessary corrections on the letter bills or lists, taking care to strike out the erroneous entries with a pen, in such a manner as to let the original entries be seen.

es rectifications devront s'o-
par le concours de deux
. A moins d'une erreur évi-
elles prévaudront sur la
ıtion originale.

n bulletin de vérification,
ne au modèle ci-annexé, sub
sera dressé par le bureau
ıtaire et envoyé sans délai,
ecommandation d'office, au
ı expéditeur.

elui-ci, après examen, le ren-
avec ses observations, s'il y

ın cas de manque d'une dé-
d'un objet recommandé ou
feuille d'avis, le fait sera
té immédiatement dans la
voulue par deux agents du
ı d'échange destinataire, et
à la connaissance du bureau
ıge expéditeur, au moyen du
n de vérification; et, si le
comporte, celui-ci devra en
ître avisé par télégramme.

ıans le cas où le bureau des-
re n'aurait pas fait parvenir
premier courrier au bureau
teur un bulletin de vérifica-
ınstatant des erreurs ou des
arités quelconques, l'absence
locument vaudra comme ac-
e réception de la dépêche et
contenu jusqu'à preuve du
ire.

3. These corrections shall be made by two officers. Except in the case of an obvious error, they shall be accepted in preference to the original statement.

4. A note of verification, in conformity with the specimen B. hereto annexed, shall be prepared by the receiving office, and sent without delay, officially registered, to the despatching office.

5. The latter, after examination, shall return it with any observations to which it may give rise.

6. In case of the failure of a mail, of a registered article, or of a letter bill, the circumstance shall be immediately recorded in the manner agreed upon by two officers of the receiving office, and reported to the despatching office by means of the note of verification; and, if needful, the latter shall also be advised thereof by telegram.

7. In case the receiving office shall not have forwarded by the first mail to the despatching office a note of verification, reporting errors or irregularities of any kind, the absence of that document shall be regarded as evidence of the due receipt of the mail and of its contents, until proof to the contrary.

X.

recommandés. Conditions de forme et de fermeture.

une condition de forme ou de
ure n'est exigée pour les ob-
commandés. Chaque Office
a faculté d'appliquer à ces
les règles établies dans son
ɜ intérieur.

X.

Registered Articles.—Conditions as to Form and Manner of Fastening.

No stipulation is insisted upon as to the form or manner of fastening of registered articles. Each Office shall have the right to apply to such description of correspondence the regulations in force in its interior service.

XI.

ıux et imprimés. Conditions de forme.

'our jouir de la modération
t qui leur est attribuée par
e 4 du traité, les livres, les
ıux, les imprimés et les autres
assimilés devront être placés
ande ou dans une enveloppe

XI.

Newspapers and Printed Papers.—Conditions as to Form.

1. In order to enjoy the reduced postage extended to them by Article 4 of the Treaty, books, newspapers, printed papers and other similar articles must be placed under band, or in an envelope,

ouverte, ou bien simplement pliés de manière à pouvoir être facilement vérifiés, et, sauf les exceptions suivantes, ils ne pourront contenir aucune écriture, chiffre ou signe quelconque fait à la main.

2) Les épreuves d'imprimerie ou de compositions musicales pourront porter des corrections à la plume se rapportant exclusivement au texte ou à la confection de l'ouvrage. Il sera permis d'y annexer les manuscrits.

3) Les circulaires, avis, etc., pourront être revêtus de la signature de l'envoyeur avec sa qualité et porter l'indication du lieu d'origine et de la date d'envoi.

4) Les livres seront admis avec une dédicace ou un hommage de l'auteur, inscrits à la main.

5) Il sera permis de marquer d'un simple trait les passages du texte sur lesquels on désire appeler l'attention.

6) Les cotes et prix courants de bourses ou de marchés imprimés, lithographiés ou autographiés pourront être admis avec des prix ajoutés à la main ou au moyen d'une impression quelconque.

7) Il ne sera admis aucune autre addition faite à la main, pas plus que celles produites au moyen de caractères typographiques, lorsque celles-ci auraient pour effet d'enlever à l'imprimé son caractère de généralité.

8) Les objets susmentionnés qui ne réuniraient pas les conditions requises ci-dessus seront considérés comme lettres non affranchies et taxés en conséquence, à l'exception seulement des journaux et des imprimés, tels que les circulaires, les avis, etc., auxquels il ne sera pas donné cours, le cas écheant.

open, or simply folded so as to admit of their being easily examined; and, except in the following particulars, they must contain no MS. writing, figure, or mark whatever.

2. Proofs of printing or of music may bear corrections, made with a pen, relating exclusively to the text or to the execution of the work. It shall be allowable to annex the manuscripts to them.

3. Circulars, notices, &c., may bear the signature of the sender, with his trade or profession, and may also indicate the place of origin and the date.

4. Books shall be admitted with a manuscript dedication or a complimentary inscription from the author.

5. It shall be permitted to mark with a simple stroke the passages in the text to which it is desired to call attention.

6. Printed, lithographed, or autographed stock and share lists, prices current, and market reports shall be admitted with the prices added in writing or by means of any impression whatever.

7. There shall not be admitted any other MS. additions, nor even those produced by means of typographical characters, if the latter tend to take from the packet its general character.

8. Such of the above-mentioned articles as shall not fulfil the foregoing conditions shall be considered as unpaid letters and charged accordingly, with the sole exception of newspapers and printed papers, such as circulars, notices, &c., which shall not be forwarded in such cases.

XII.

Echantillons. Conditions de forme.

1) Les échantillons de marchandises ne seront admis à bénéficier de la modération de port qui leur

XII.

Patterns of Merchandise.—Conditions of Form.

1. Patterns of merchandise shall only be admitted to the benefit of the reduced postage which is ex-

:ribuée par l'article 4 du traité
ous les conditions suivantes:

ls devront être placés dans
acs, des boîtes ou des en-
pes mobiles, de manière à per-
e une facile vérification.
ls ne pourront avoir aucune
: marchande, ni porter aucune
re à la main que le nom ou
ison sociale de l'envoyeur,
sse du destinataire, une mar-
e fabrique ou de marchand,
méros d'ordre et des prix.

l est interdit de réunir ces
à une lettre ou a un envoi
autre nature, sauf le cas où
aient partie intégrante d'un
ge special.
Les échantillons qui ne rem-
ent pas les conditions requises
taxés comme lettres, sauf
qui auraient une valeur. Ces
rs ne seront pas expédiés,
lus que ceux dont le trans-
offrirait des inconvénients ou
nger.

XIII.

Papiers d'affaires.

Seront considérés comme pa-
d'affaires et admis comme tels
modération de port consacrée
article 4 du traité, les actes
out genre dressés par les
rs ministériels, les lettres de
e, les différents documents de
e des compagnies d'assur-
les copies ou extraits d'actes
seing privé écrits sur papier
é ou non timbré, les partitions
illes de musique manuscrites
néralement toutes les pièces et
es documents écrits à la main
ont pas le caractère d'une cor-
ndance *actuelle* et *personnelle.*
Les papiers d'affaires devront
expédiés sous une bande
e et conditionnés de manière
voir être facilement vérifiés.
Les envois qui ne rempliraient
es conditions énoncées ci-
s seront considérés comme
s non affranchies et taxés en
quence.

tended to them by Article 4 of the Treaty under the following conditions:

2. They must be placed in bags, or in boxes, or envelopes removable so as to admit of an easy examination.

3. They must not have any salable value, nor bear any MS. writing other than the name or the trade or profession of the sender, the address of the person for whom the packet is intended, a manufacturer's or trade mark, numbers and prices.

4. It is forbidden to introduce these articles into a letter, or into a packet of any other kind, save in the case in which they form an integral part of a particular work.

5. Patterns which are not in accordance with the requisite conditions shall be charged as letters, except those which are valuable. The latter shall not be forwarded, nor those the conveyance of which would be attended with risk or danger.

XIII.

Legal and Commercial Documents.

1. The following articles shall be considered as legal and commercial documents, and admitted as such to the reduced postage conferred by Art. 4 of the Treaty: acts or deeds of all kinds drawn up by public functionaries, invoices, the various documents on the service of insurance companies, copies or extracts of deeds under private seal written upon stamped or unstamped paper, scores or sheets of MS. music, and in general all MS. papers and documents which have not the character of an *actual* and *personal* correspondence.

2. Commercial and legal documents must be sent under a movable band, and made up so as to admit of their being easily examined.

3. Packets which do not fulfil the conditions above enumerated shall be considered as unpaid letters and charged accordingly.

XIV.

Correspondance avec les pays étrangers.

1) Les Offices de l'Union qui ont des relations régulières établies avec des pays situés en dehors de l'Union admettront tous les autres Offices à profiter de ces relations pour l'échange de leurs correspondances, contre paiement des taxes dues pour le transport en dehors des limites de l'Union.

2) Ils auront, en conséquence, à fournir aux Offices intéressés un tableau conforme au modèle joint au présent règlement, sub lit. C, et qui indiquera les conditions de prix auxquelles pourront être échangées les correspondances à expédier ou à recevoir par les dites voies.

3) Les changements introduits dans ces conditions devront être notifiés en temps opportun.

XIV.

Correspondence with Foreign Countries.

1. The Offices of the Union which have regular relations established with countries situated beyond the Union shall admit all the other Offices to take advantage of those relations for the exchange of their correspondence, on payment of the charges due for the conveyance beyond the limits of the Union.

2. They shall, consequently, furnish the Offices interested, with a table similar to the specimen C. appended to the present Regulations, which shall indicate the conditions as to payment under which may be exchanged the correspondence to be sent or received by the said routes.

3. Due notice shall be given of any alterations introduced into those conditions.

XV.

Correspondances mal dirigées.

Les objets de toute nature mal dirigés seront, sans aucun délai, réexpédiés par la voie la plus directe vers leur destination, contre remboursement ou bonification, s'il y a lieu, des taxes pour lesquelles ils auraient été portés en compte.

XV.

Misdirected Correspondence.

Missent articles of all kinds shall be re-forwarded without delay to their destination by the most direct route, subject, where the case occurs, to a charge or claim of the amounts for which they may have been originally brought to account.

XVI.

Rebuts.

1) Les correspondances qui seront tombées en rebut pour quelque cause que ce soit devront être renvoyées aussitôt après leur mise en rebut par l'intermédiaire des bureaux d'échange respectifs.

2) Les rebuts renvoyés seront enliassés séparément et pourvus d'une étiquette portant le mot "rebuts."

3) Ceux des dits objets qui auront été affranchis seront livrés sans aucun compte.

XVI.

Undelivered Correspondence.

1. The correspondence which shall not be delivered, from whatever cause, shall be returned immediately through the respective offices of exchange.

2. Returned letters shall be tied up separately, and inscribed with a label bearing the words "Returned letters."

3. Those articles which shall have been paid shall be returned without any claim.

4) Les lettres non affranchies ou insuffisamment affranchies seront également livrées sans compte, pour autant qu'elles sont originaires d'un pays de l'Union.

5) Celles des dites correspondances qui se trouveraient grevées de débours seront portées au crédit de l'Office qui en fait le renvoi (tableau N° I de la feuille d'avis).

4. Unpaid or insufficiently paid letters shall, in like manner, be returned without claim, in so far as they may have originated in a country of the Union.

5. Those which may have been charged with foreign rates shall be entered to the credit of the Office which returns them. (Table No. I. of the Letter Bill.)

XVII.

Comptabilité.

1) Chaque Administration fera établir mensuellement, pour chaque dépêche reçue, un état conforme au modèle annexé au présent règlement, sub lit. D, comprenant les correspondances inscrites aux feuilles d'avis de ses correspondants.

2) Ces états seront ensuite récapitulés dans un compte conforme au modèle lit. E.

3) Le compte accompagné des états et des feuilles d'avis (dont on détachera le tableau N° IV) sera soumis à la vérification de l'Office correspondant, dans le courant du mois qui suit celui auquel il se rapporte.

4) Les comptes mensuels, après avoir été vérifiés et acceptés de part et d'autre, seront résumés en un compte général trimestriel par les soins de l'Administration de celui des deux pays qui sera placé le premier dans l'ordre alphabétique, sauf autre arrangement à prendre à cet égard par les Administrations intéressées.

5) Ces divers comptes seront établis en francs et centimes.

6) Le solde résultant du compte général sera payé au pays créditeur en francs effectifs au moyen de traites tirées sur des places à désigner d'avance et d'un commun accord.

XVII.

Accounts.

1. Each Office shall prepare monthly, for each mail received, a statement similar to the specimen D. appended to the present Regulations, comprising the correspondence brought to account on the letter bills received.

2. Those statements shall afterwards be incorporated in an account similar to the specimen E.

3. The account, accompanied by the statements and the letter bills (from which table IV. shall be detached), shall be submitted to the examination of the corresponding Office during the month following that to which it relates.

4. The monthly accounts, after having been mutually examined and accepted, shall be included in a quarterly general account to be prepared by the Office of that one of the two countries which shall be placed first in alphabetical order, in the absence of any other arrangement on this point which may be adopted by the Offices interested.

5. These several accounts shall be drawn up in francs and centimes.

6. The balance resulting from the general account shall be paid to the country to which it is due in francs in cash, by means of bills drawn upon places to be determined beforehand by mutual consent.

XVIII.

Périodes de statistique.

1) La statistique générale à établir en vertu de l'article 10, § 12, du

XVIII.

Periods for Statistics.

1. The general statistical account to be taken by virtue of § 12, Art.

traité pour régler le paiement des droits de transit sera dressée en premier lieu, pendant sept jours consécutifs chaque fois, à partir du 1er Août 1875 et du 1er Décembre de la même année. Elle servira de base pour les paiements à faire, jusqu'au 30 Juin 1876.

2) Pour les statistiques à établir ultérieurement, elles se feront à partir du 1er Juin et du 1er Décembre.

3) Il sera procédé à ces opérations de statistique conformément aux dispositions des articles XIX à XXIII suivants.

10 of the Treaty for the purpose of regulating the payment of the transit rates, shall be prepared, in the first instance, during seven consecutive days on each occasion, from the 1st August, 1875, and from the 1st December in the same year. It shall serve as a basis, for the payments to be made, up to the 30th June, 1876.

2. The subsequent statistical accounts shall be taken for the periods commencing on the 1st June and 1st December respectively.

3. These statistical operations shall be carried out in conformity with the stipulations of Arts. XIX. to XXIII. following.

XIX.

Statistique du transit à découvert.

1) L'Office servant d'intermédiaire pour la transmission des correspondances en transit *à découvert*, reçues directement d'un autre Office, dressera d'avance, pour chaque relation, un tableau d'après le formulaire lit. F, dans lequel il indiquera, en distinguant au besoin les diverses voies d'acheminement, les prix de transit, au poids, à payer à tous les pays intermédiaires à partir de la frontière de sortie de l'Office expéditeur jusqu'à la frontière d'entrée de l'Office destinataire. Au besoin, il se renseignera en temps utile, auprès des Offices des pays à traverser, sur les voies que devront suivre les correspondances et sur les prix à leur appliquer.

2) Après avoir dressé ce formulaire, le dit Office en remettra un double à l'Office expéditeur intéressé, pour servir de base à un décompte spécial à établir entre eux du chef de ce transit.

3) Le bureau d'échange expéditeur renseignera dans un tableau d'après le formulaire lit. G, qu'il joindra à son envoi, le poids global, en deux catégories, des correspon-

XIX.

Statistics of Transit in Open Mails.

1. The Office serving as the medium for the transmission of correspondence in transit *in open mails* received directly from another Office shall prepare beforehand for each separate service a table, according to the form F, in which it shall indicate, distinguishing, if needful, the different routes of transmission, the transit rates to be paid, by weight, to all the intermediate countries, starting from the frontier of exit of the despatching Office up to the frontier of entry of the Office of destination. If needful, it shall communicate in due time with the Offices of the countries to be traversed, as to the route which the correspondence shall take, and as to the rates to be paid upon it.

2. After having prepared this table, the said Office shall forward a copy of it to the despatching Office interested, in order to serve as the basis of a special account to be established between them with reference to this transit.

3. The despatching office of exchange shall communicate in a table according to the specimen form G., which it shall join to its despatch, the total weight, in two

:s qu'il livrera en transit au ıu d'échange correspondant, et ci, après vérification, prendra son de ces correspondances les acheminer vers leurs des- ions en les confondant avec ıennes propres pour le paie- des droits de transit ultéri-

Le décompte particulier dont question ci-dessus sera dressé l'Office qui reçoit les corres- ances en transit, et soumis à rification de l'Office expédi-

XX.

ıtique du transit en dépêches closes.

Les correspondances expé- en dépêches closes à travers rritoire d'un ou de plusieurs s Offices devront faire l'objet relevé, formulaire lit. H. Le ıu d'échange expéditeur in- à la feuille d'avis pour le ıu d'échange destinataire de la che, le poids net des lettres et des imprimés, etc., sans dis- ion de l'origine de ces corres- ances. Ces indications se- vérifiées par le bureau destina- , lequel aura à établir, à la fin période de statistique, le re- mentionné ci-dessus, en au- d'expéditions qu'il y aura d'Of- intéressés, y compris celui du le départ.

Ces relevés seront soumis à rification du bureau expédi- et, après avoir été acceptés ui, il en sera envoyé un exem- e à chacun des Offices inter- aires.

XXI.

Comptes du transit.

tableau lit. G et le relevé lit. ront résumés dans un compte culier, par lequel on établira ix annuel de transit revenant ıque Office, en multipliant par s totaux réunis des deux péri- . Le soin d'établir ce compte nbera à l'Office créditeur, sauf

categories, of the correspondence which it shall deliver in transit to the corresponding office of exchange; and the latter, after verification, shall undertake the further transmission of the correspondence to its destination in mixing it with its own, in respect to the payment of the further transit rates.

4. The special account above referred to shall be prepared by the Office which receives the correspondence in transit, and shall be submitted to the examination of the despatching Office.

XX.

Statistics of Transit in Closed Mails.

1. The correspondence forwarded in closed mails across the territory of one or more other Offices shall form the object of a statement similar to specimen H. The despatching office of exchange shall enter in the letter bill for the receiving office of exchange the net weight of the letters, and of the printed papers, &c., without distinction of the origin of the correspondence. These entries shall be verified by the receiving office, which shall prepare, at the end of the period for taking the statistics, the statement above mentioned, in as many copies as there are Offices interested, including the Office of the place of final despatch.

2. These statements shall be submitted to the verification of the despatching office, and, after having been accepted by it, a copy of the same shall be sent to each of the intermediate Offices.

XXI.

Transit Accounts.

The table G. and the statement H. shall be incorporated in a special account, by which shall be determined the annual amount of transit payable to each Office, in multiplying by 26 the combined totals of the two periods. The duty of preparing this account shall fall

autre arrangement à intervenir d'un commun accord.

upon the Office having to receive payment, subject to any other arrangement to be adopted by common consent.

XXII.

Transit des cartes-correspondance.

Les cartes-correspondance seront assimilées aux lettres en ce qui concerne le paiement des droits de transit. Ces objets devront en conséquence être compris dans la pesée des lettres.

XXII.

Transit of Post-Cards.

Post-cards shall be assimilated to letters in so far as concerns the payment of the transit rates. Those articles must consequently be included in the weight of the letters.

XXIII.

Exemption des droits de transit.

Sont exempts de la bonification des frais de transit territoriaux et maritimes les correspondances réexpédiées et mal dirigées, les rebuts, les mandats de poste, les pièces de comptabilité et autres documents relatifs au service postal.

XXIII.

Exemption from Transit Rates.

The following articles are exempt from payment of the costs of territorial and sea-conveyance:—

Redirected and missent correspondence, undelivered correspondence, post office money orders, documents of accounts, and other documents relating to the postal service.

XXIV.

Poids de journaux et des imprimés.

Il est admis par mesure d'exception que les Etats qui, à cause de leur régime intérieur, ne pourraient adopter le type de poids décimal métrique, auront la faculté d'y substituer l'once, *avoirdupois* (28.3465 grammes) en assimilant une demi-once à 15 grammes et deux onces à 50 grammes, et d'élever, au besoin, la limite du port simple des journaux à quatre onces, mais sous la condition expresse que dans ce dernier cas le port des journaux ne soit pas inférieur à 10 centimes et qu il soit perçu un port entier par nu'méro de journal, alors même que plusieurs journaux se trouveraient groupés dans un même envoi.

XXIV.

Weight of Newspapers and Printed Papers.

As an exceptional measure, it is agreed that the States which, in consequence of their internal regulations, are unable to adopt the decimal metrical system of weight, shall have the right to substitute for it the ounce *avoirdupois* (28.3465 grammes), by assimilating a half-ounce to 15 grammes, and two ounces to 50 grammes, and to raise, if needful, the limit of the single rate of postage of newspapers to four ounces, but under the express condition that, in the latter case, the postage on newspapers be not less than 10 centimes, and that an entire rate of postage be charged for each copy of the newspaper, even though several newspapers be included in the same packet.

XXV.

Monnaies, bijoux.

On n'admettra au transport par la poste aucune lettre ou autre envoi qui contiendrait soit de l'or ou

XXV.

Money; Jewelry.

There shall not be admitted for conveyance by the post, any letter or other packet which may contain

·gent monnayé, soit des bi-
ıu des effets précieux, soit
ɔjet quelconque possible de
de douane.

either gold or silver money, jewels or precious articles, or any other article whatever liable to Customs duties.

XXVI.

·correspondance et lettres non admises au transport.

e sera pas donné cours aux
correspondance qui ne serai-
ıs complètement affranchies.
e Administration aura, en
la faculté de ne pas expédier
ne pas admettre dans son
› les cartes-correspondance
t des inscriptions qui serai-
ɛrdites par les dispositions
ı ou règlementaires en vi-
dans le pays. Il en sera de
pour les lettres et les autres
de correspondance qui por-
ıt extérieurement des inscrip-
le l'espèce.

XXVI.

Post-cards and Letters not admitted to conveyance.

Post-cards which are not fully prepaid shall not be forwarded. Each Office shall have, moreover, the right not to forward or not to admit in its service post-cards bearing any description of writing which may be forbidden by the statutory or administrative enactments in force in the country. The same shall be the case for letters and other articles which may bear externally any writing of the character referred to.

XXVII.

Bureau international.

'Administration supérieure
'ostes de la Confédération
est designée pour organiser
reau international institué
ırt. 15 du traité. Ce bureau
ɛncera à fonctionner aussitôt
'échange des ratifications du

ıes frais communs du Bureau
ıtional ne doivent pas dépas-
ır année, la somme de 75,000
, non compris les frais spéci-
xquels donneront lieu les ré-
, périodiques du Congrès
. Cette somme pourra être
ıntée ultérieurement, du con-
ıent de toutes les Adminis-
ıs contractantes.
'Administration désignée par
-dessus surveillera les dé-
ı du Bureau international,
es avances nécessaires et
'a le compte annuel, qui sera
ınıqué à toutes les autres
ıistrations.
'our la répartition des frais
ys contractants et ceux qui

XXVII.

International Office.

1. The Administration of the Posts of the Swiss Confederation is selected to organise the International Office established by Art. 15 of the Treaty. That Office shall commence its functions immediately after the exchange of the ratifications of the Treaty.

2. The ordinary expense of the International Office must not exceed the sum of 75,000 francs annually, exclusive of the special expenses to which the periodical meetings of the Postal Congress may give rise. That sum may be increased ultimately, with the consent of all the contracting Offices.

3. The Administration named in par. 1. above shall superintend the expenses of the International Office, shall make the necessary advances, and shall prepare the annual account, which shall be communicated to all the other Offices.

4. For the division of the expenses, the contracting countries

seraient admis ultérieurement à adhérer à l'Union postale, seront divisés en six classes contribuant chacune dans la proportion d'un certain nombre d'unités, savoir :

1re classe	- -	25 unités
2e "	- -	20 "
3e "	- -	15 "
4e "	- -	10 "
5e "	- -	5 "
6e "	- -	3 "

5) Ces coëfficients seront multipliés par le nombre des pays de chaque classe et la somme des produits ainsi obtenus fournira le nombre d'unités par lequel la dépense totale doit être divisée. La quotient donnera le montant de l'unité de dépense.

6) Les pays contractants sont classés ainsi qu'il suit, en vue de la répartition des frais :

1re classe: Allemagne, Autriche-Hongrie, Etats-Unis d'Amérique, France, Grande-Bretagne, Italie, Russie, Turquie;

2e " Espagne;

3e " Belgique, Egypte, Pays-Bas, Roumanie, Suède;

4e " Danemark, Norvège, Portugal, Suisse;

5e " Grèce, Serbie;

6e " Luxembourg.

7) Le Bureau international servira d'intermédiaire aux notifications régulières et générales qui intéressent les relations internationales. Il recevra également de chaque Administration les documents publiés sur le service intérieur.

8) Chaque Administration fera parvenir dans le 1er semestre de chaque année au Bureau international une série complète des renseignements statistiques se rapportant à l'année précédente sous orme de tableaux dressés d'après les indications du Bureau international, qui distribuera à cet effet

and those which may be hereafter admitted to join the Postal Union shall be divided into six classes, each contributing in the proportion of a certain number of units, viz:—

1st class	- -	25 units.
2nd "	- -	20 "
3rd "	- -	15 "
4th "	- -	10 "
5th "	- -	5 "
6th "	- -	3 "

5. These co-efficients shall be multiplied by the number of countries of each class, and the total of the products thus obtained shall furnish the number of units by which the whole expense shall be divided. The quotient will give the amount of the unit of expense.

6. The contracting countries are classified as follows, in view of the division of the expenses:—

1st class: Germany, Austro-Hungary, United States of America, France, Great Britain, Italy, Russia, Turkey;

2nd " Spain;

3rd " Belgium, Egypt, Netherlands, Roumania, Sweden;

4th " Denmark, Norway, Portugal, Switzerland;

5th " Greece, Servia;

6th " Luxemburg.

7. The International Office shall serve as the medium for the regular and general notifications which concern international relations. It shall equally receive from each Office published documents relative to its interior service.

8. Each Office shall furnish the International Office, in the first half of each year, with a complete series of statistical details relating to the previous year, in the form of tables prepared according to directions from the International Office which shall distribute with that view forms properly prepared. It

rmules toutes préparées. Il a ces renseignements en une ique générale qui sera dise à toutes les Administra-

e Bureau international ré-, à l'aide des documents qui is à sa disposition, un jourécial en langues allemande, se et française.

Les numéros de ce journal, me que tous les documents s par le Bureau international, distribués aux Administrade l'Union, dans la proporu nombre des unités contris mentionnées au § 4. Les laires et documents supplélires qui seraient réclamés payés à part d'après leur e revient. Les demandes de nature devront être formu- temps opportun.

Le Bureau international devra ir, en tout temps, à la dispodes membres de l'Union, pour ournir, sur les questions relaau service international des , les renseignements spéciaux ls pourraient avoir besoin.

Lorsqu'il aura soumis aux nistrations la solution d'une ion qui réclame l'assentiment us les membres de l'Union, qui n'auront point fait parveur réponse dans le délai de e mois seront considérés e consentants.

L'Administration du pays où iéger le prochain Congrès posréparera avec le concours du u international les travaux ngrès.

Le directeur du Bureau interal assistera aux séances du rès et prendra part aux discussans voix délibérative.

Il fera, sur sa gestion, un rt annuel qui sera commu- à tous les membres de n.

La langue officielle du Bureau ational sera la langue fran-

shall incorporate those details in a general statistical report, which shall be distributed to all the Offices.

9. The International Office shall publish, by the aid of the documents which are put at its disposal, a special journal in the German, English and French languages.

10. The numbers of this journal, as well as all the documents published by the International Office, shall be distributed to the Offices of the Union in the proportion of the number of contributing units mentioned in par. 4. Any additional copies and documents which may be applied for shall be paid for separately at prime cost. Applications of this nature should be made in due time.

11. The International Office shall hold itself always at the disposal of the members of the Union for the purpose of furnishing them with any special information they may require upon questions relating to the International Postal Service.

12. When it shall have submitted to the solution of the several Offices a question which requires the assent of all the members of the Union, those which shall not have sent in their reply within a period of four months shall be considered as giving their consent.

13. The Office of the country in which the next Postal Congress is to be held, shall prepare, with the assistance of the International Office, the business to be submitted to the Congress.

14. The director of the International Office shall be present at the sittings of the Congress, and shall take part in the discussions, but without the power of voting.

15. There shall be issued, under his superintendence, an annual report, which shall be communicated to all the members of the Union.

16. The official language of the International Office shall be the French language.

XXVIII.

Langue.

1) Les feuilles d'avis, les comptes et autres formulaires à l'usage des Administrations de l'Union seront, en règle générale, rédigés en langue française, à moins que les Administrations intéressées n'en disposent autrement par une entente directe.

2) En ce qui concerne la correspondance de service, l'état de choses actuel sera maintenu, sauf autre arrangement à intervenir ultérieurement et d'un commun accord entre les Administrations intéressées.

XXVIII.

Language.

1. The letter bills, accounts, and other forms used by the Post Offices of the Union shall, as a general rule, be drawn up in the French language, unless the Offices interested arrange otherwise by direct agreement.

2. As regards official correspondence, the present state of things shall be maintained, unless any other arrangement should subsequently be agreed upon by common consent between the Offices interested.

XXIX.

Ressort de l'Union.

Seront considérés comme appartenant à l'Union générale des postes:

1° L'Islande et les îles Faroë, comme faisant partie du Danemark.

2° Les îles Baléares, les îles Canaries, les possessions espagnoles de la côte septentrionale d'Afrique et les établissements de poste de l'Espagne sur la côte occidentale du Earoc, comme faisant partie de l'Espagne.

3° L'Algérie, comme faisant par tie de la France.

4° L'île de Malte, comme relevant de l'Administration des Postes de la Grande-Bretagne.

5° Madère et les Açores, comme faisant partie du Portugal.

6° Le Grande-Duché de Finlande, comme faisant partie intégrante de l'Empire de Russie.

XXIX.

District of the Union.

The following shall be considered as belonging to the General Postal Union:—

1. Iceland and the Faroe Islands, as forming part of Denmark.

2. The Balearic Isles, the Canary Islands, the Spanish possessions on the Northern Coast of Africa, and the Postal establishments of Spain upon the Western Coast of Morocco, as forming part of Spain.

3. Algeria, as forming part of France.

4. The Island of Malta, as subordinate to the Post Office of Great Britain.

5. Madeira and the Azores, as forming part of Portugal.

6. The Grand Duchy of Finland, as forming an integral part of the Empire of Russia.

XXX.

Durée du Règlement.

Le présent règlement sera exécutoire à partir du jour de la mise en vigueur du traité du 9 Octobre 1874. Il aura la même durée que ce traité, à moins qu'il ne soit modifié d'un

XXX.

Duration of the Regulations.

The present Regulations shall be put into execution on the day on which the Treaty of the 9th October 1874 comes into force. They shall have the same duration as that

n accord entre les parties
ées.

e, le 9 Octobre 1874.

les Etats-Unis d'Amérique:
[H. BLACKFAN.
l'Allemagne:
AN.
ER.
l'Autriche:
ON DE KOLBENSTEINER.
.
la Hongrie:
VAY.
M.
la Belgique:
UX.
NT.
.
le Danemark:
R.
l'Egypte:
BEY.
l'Espagne:
MANSI.
C. DE NAVASQÜES.
la France: (3 mai 1875,)
RCOURT.
la Grande-Bretagne:
S. PAGE.
la Grèce:
SOLAS.
BÉTANT.
l'Italie:
IO.
le Luxembourg:
OEBE.
la Norvège:
EN.
les Pays-Bas:
DE.
EERTS DE LANDAS WY-
H.
le Portugal:
DO LESSA.
la Roumanie:
E F. LAHOVARI.
la Russie:
VELHO.
ES POGGENPOHL.

Treaty, unless they should be modified by common consent between the parties interested.

Berne, 9th October, 1874.

For the United States of America:
JOSEPH H. BLACKFAN.
For Germany:
STEPHAN.
GÜNTHER.
For Austria:
LE BARON DE KOLBENSTEINER.
PILHAL.
For Hungary:
M. GERVAY.
P. HEIM.
For Belgium:
FASSIAUX.
VINCHENT.
J. GIFE.
For Denmark:
FENGER.
For Egypt:
MUZZI BEY.
For Spain:
ANGEL MANSI.
EMILIO C. DE NAVASQÜES.
For France: (May 3, 1875,)
B. D'HARCOURT.
For Great Britain:
WM. JAS. PAGE.
For Greece:
A. MANSOLAS.
A. H. BÉTANT.
For Italy:
TANTESIO.
For Luxemburg:
VON ROEBE.
For Norway:
C. OPPEN.
For the Netherlands:
HOFSTEDE.
B. SWEERTS DE LANDAS WYBORGH.
For Portugal:
EDUARDO LESSA.
For Roumania:
GEORGE F. LAHOVARI.
For Russia:
BARON VELHO.
GEORGES POGGENPOHL.

Pour la Serbie:
MLADEN Z. RADOJKOVITCH.

Pour la Suède:
W. ROOS.

Pour la Suisse:
EUGÈNE BOREL.
NAEFF.
DR. J. HEER.

Pour la Turquie:
YANCO MACRIDI.

For Servia:
MLADEN Z. RADOJKOVITCH.

For Sweden:
W. ROOS.

For Switzerland:
EUGÈNE BOREL.
NAEFF.
DR. J. HEER.

For Turkey:
YANCO MACRIDI.

Administration des Postes
d ——

A.

Correspondance avec l'Office
d ——

FEUILLE D'AVIS.

(Timbre du bureau expéditeur.)
O

Dépêche du bureau d'échange —— d —— pour le bureau d'échange —— d ——
Départ du —— 187 — à —— h. —— m. du ——
Arrivée le —— 187 — à —— h. —— m. du ——

I. Avoir de l'office d'échange expéditeur.			II. Avoir de l'office d'échange destinataire.		
	Fr.	*Cs.*		*Fr.*	*Cs.*
Débours (Port étranger, taxe des correspondances réexpédiées)	.....	....	Bonifications (Taxes etc.) { *a.* Objets ordinaires	.....	....
			b. Objets recommandés	.....	....

(Timbre du bureau expéditeur.)
O

IV. Envois recommandés.

(Timbre du bureau destinataire.)
O

Nos d'ordre.	Timbre d'origine.	Numéros du registre des bureaux d'origine ou noms des destinataires et lieux de destination.	A bonifier à l'Office d'échange destinataire.				Observations.
			Port étranger.		Droit de recommandation.		
1	2	3	4		5		6
			Fr.	*Cs.*	*Fr.*	*Cs.*	
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

III. Dépêches closes.

Bureau d'origine. 1	Bureau de destination. 2	Nombre des dépêches closes. 3	Observations. 4

Nos d'ordre. 1	Timbre d'origine. 2	Numéros du régistre des bureaux d'origine ou noms des destinataires et lieux de destination. 3	A bonifier à l'Office d'échange destinataire.				Observations. 6
			Port étranger. 4		Droit de recommandation. 5		
			Fr.	*Cs.*	*Fr.*	*Cs.*	
11							
12							
13							
14							
15							
16							
etc.							
		Totaux.....	.....	.....	.....	.....	
	Total général à reporter au Tableau N° II, lit. *b*.....		.....				

L'employé du bureau d'échange expéditeur: .....

L'employé du bureau d'échange destinataire: .....

stal Administration of ——.

A.

Correspondence with the Office of ——.

LETTER-BILL.

:amp of despatching office.)

Mail from the exchange office of —— for the exchange office of ——.
Departure of ——, 187—, at —— o'clock.
Arrival of ——, 187 -, at —— o'clock.

CREDIT OF THE DESPATCHING EXCHANGE OFFICE.			II. CREDIT OF THE RECEIVING EXCHANGE OFFICE.		
	Fr.	*Cs.*		*Fr.*	*Cs.*
CLAIMS foreign postage-charge on re-forwarded correspondence)	.....	....	CREDITS (charges, &c.) { *a.* Ordinary correspondence	.....	....
			b. Registered correspondence	.....	....

tamp of despatching office.)

IV. REGISTERED DISPATCHES.

(Stamp of receiving office.)

Nos. of order.	Stamp of origin.	Registration numbers of the offices of origin or names of the addressees and places of destination.	To pay to the receiving exchange Office.				Observations.
			Foreign postage.		Registration fee.		
1	2	3	4		5		6
			Fr.	*Cs.*	*Fr.*	*Cs.*	
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

III. Closed mails.

Office of origin.	Office of destination.	Number of the closed mails.	Observations.
1	2	3	4

Nos. of order.	Stamp of origin.	Registration numbers of the offices of origin or names of the addresses and places of destination.	To pay to the receiving Office of exchange.				Observations.
			Foreign postage.		Registration fee.		
1	2	3	4		5		6
			Fr.	*Cs.*	*Fr.*	*Cs.*	
11							
12							
13							
14							
15							
16							
etc.							
		Totals.....	.....	.....	.....	.....	
	General total to carry to Table No. II, *b*.....		.....				

Clerk of the despatching exchange office: .....

Clerk of the receiving exchange office: .....

istration des Postes
d ——

B.

Correspondance avec l'Office
d ——

BULLETIN DE VÉRIFICATION

s rectification et la constatation des erreurs et irrégularités de toute nature reconnues dans la dépêche du bureau d'échange d —— *pour le bureau d'échang e d* ——

Expédition du —— 187-, à —— h. —— m. du ——

éros des bleaux de feuille vis.	Désignation des correspondances.	Déclaration du bureau d'échange expéditeur.		Vérification du bureau d'échange destinataire.		Causes de la rectification.
1	2	3		4		5
	ERREURS DE COMPTE.	*Fr.*	*Cs.*	*Fr.*	*Cs.*	

AUTRES ERREURS OU IRRÉGULARITÉS.

nque de la dépêche, manque d'objets recommandés ou de la feuille d'avis, dépêche spoliée, lacérée uvais état, etc., etc.)

A ——, le —— 187-
nployés du bureau d'échange destinataire :

.....

Vu et accepté
A ——, le —— 187-
Le chef du bureau d'échange expéditeur :

.....

Postal Administration of ——.

B.

Correspondence with the Office of ——.

BULLETIN OF VERIFICATION

for the correction and statement of the errors and irregularities of all kinds found in the mail from the exchange office of —— for the exchange office of ——.

Despatch of the ——, 187–, at —— o'clock.

Numbers of the tables of the letter-bill.	Description of the correspondence.	Statement of the despatching exchange office.		Verification by the receiving exchange office.		Causes of the correction.
1	2	3		4		5
	ERRORS OF ACCOUNT.	*Fr.*	*Cs.*	*Fr.*	*Cs.*	

OTHER ERRORS OR IRREGULARITIES.

Missing mail, missing registered articles or letter-bill, robbed, torn, or injured mail, &c., &c.)

—— the ——, 187–.
Clerks of receiving exchange office:

.....

Examined and accepted.
—— the ——, 187–.
Chief of despatching exchange office:

.....

dministration des Postes
d ———

C.

TABLEAU

ndiquant les conditions auxquelles pourront être échangées, à découvert, entre les Administrations de l'Union postale et l'Administration d ———, les lettres et les autres objets de correspondance originaires ou à destination des pays étrangers auxquels cette dernière Administration sert d'intermédiaire.

TABLEAU

indiquant les conditions auxquelles pourront être échangées à découvert entre les Administrations de l'Union postale et l'Administration d———, les lettres et les autres objets de correspondance originaires ou à destination des pays étrangers auxquels cette dernière Administration sert d'intermédiaire.

Nos	Pays de destination ou d'origine.	Lettres ordinaires.							Lettres recommandées.				Journaux ou autres imprimés.			Echantillons de marchandises.			Observations.
		Conditions de l'affranchissement.	Limites de l'affranchissement.	Poids en grammes d'une lettre simple.	Lettres affranchies pour l'étranger.		Lettres non affranchies de l'étranger.		Poids en grammes d'une lettre simple.	BONIFICATIONS.			Poids en grammes d'un paquet simple.	BONIFICATIONS (Port étranger.)		Poids en grammes d'un paquet simple.	BONIFICATIONS (Port étranger.)		
					BONIFICATIONS (Port étranger.)		DÉBOURS (Port étranger.)			Droit de recommandation.	Port.								
1	2	3	4	5	6		7		8	9	10		11	12		13	14		15
					Fr.	*Cs.*	*Fr.*	*Cs.*			*Fr.*	*Cs.*		*Fr.*			*Fr.*	*Cs.*	

'ostal Administration of———

C.

TABLE

howing the conditions under which there may be exchanged in open mails, between the Administrations of the Postal Union and the Administration of———, letters and other correspondence originating in or addressed to the foreign countries to which the latter Administration serves as intermediary.

TABLE

Showing the conditions under which there may be exchanged in open mails, between the Administrations of the Postal Union and the Administration of ——, letters and other correspondence originating in or addressed to the foreign countries to which the latter Administration serves as intermediary.

Nos.	Country of destination or of origin.	Ordinary letters.							Registered letters.				Newspapers or other prints.			Samples of merchandise.			Observations.
		Condition of prepayment.	Limit of prepayment.	Weight in grammes of a single letter.	Prepaid letters for foreign countries.		Unpaid letters from foreign countries.		Weight in grammes of a single letter.	Credits.			Weight in grammes of a single packet.	Credits. (foreign postage.)		Weight in grammes of a single packet.	Credits. (foreign postage.)		
					Credits. (foreign postage.)		Claims. (foreign postage.)			Register fee.	Postage.								
1	2	3	4	5	6		7		8	9	10		11	12		13	14		15
					Fr.	*Cs.*	*Fr.*	*Cs.*			*Fr.*	*Cs.*		*Fr.*	*Cs.*		*Fr.*	*Cs.*	

Administration des Postes
d ——

D.

Correspondance avec l'Office
d ——

ETAT MENSUEL

du contenu des dépêches du bureau d —— *pour le bureau d* ——
Départ de —— h. —— m. du ——
Mois d —— 187-

Dates.	NUMÉROS DES ARTICLES DES COMPTES.						Observations.
	I. Avoir de l'Office d'échange expéditeur.		II. Avoir de l'Office d'échange destinataire.				
			a. Objets ordinaires.		b. Objets recommandés.		
1	2		3		4		5
	Fr.	*Cs.*	*Fr.*	*Cs.*	*Fr.*	*Cs.*	
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
Totaux							

Postal Administration of ——.

D.

Correspondence with the Office of of ——.

MONTHLY STATEMENT

of the contents of the mails from the office of ——, *for the office of* ——.
Departure of —— at —— o'clock of the ——.
Month of ——, 187—.

Dates.	NUMBER OF THE ITEMS OF THE ACCOUNTS.						Observations.
	I. Credit of the despatching exchange Office.		II. Credit of the receiving exchange Office.				
			a. Ordinary correspondence.		*b.* Registered correspondence.		
1	2		3		4		5
	Fr.	*Cs.*	*Fr.*	*Cs.*	*Fr.*	*Cs.*	
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
Totals.							

Administration des Postes d——

E.

Correspondance avec l'Office d——

COMPTE

des états mensuels des feuilles d'avis des bureaux ——
pour les bureaux ——

Mois d —— 187—

N° d'ordre.	Désignation des dépêches.		NUMÉROS DES ARTICLES DES COMPTES.						Observations.
			I. Avoir de l'Office d'échange expéditeur.		II. Avoir de l'Office d'échange destinataire.				
	Origine.	Destination.			a. Objets ordinaires.		b. Objets recommandés.		
1	2	3	4		5		6		7
			Fr.	Cs.	Fr.	Cs.	Fr.	Cs	
		Totaux							

Postal Administration of ——.

E.

Correspondence with the Office of ——

ACCOUNT

of the month'y statements of the letter bills from the offices of ——
for the offices of ——
Month of ——, 187—.

Numbers of order.	Description of the mails.		NUMBERS OF THE ITEMS OF ACCOUNT.						Observations.
			I. Credit of the despatching exchange Office.		II. Credit of the receiving exchange Office.				
	Origin.	Destination.			a. Ordinary correspondence.		b. Registered correspondence.		
1	2	3	4		5		6		7
			Fr.	*Cs.*	*Fr.*	*Cs.*	*Fr.*	*Cs.*	
		Totals							

Office expéditeur F *Office destinataire réexpéditeur*

TRANSIT A DÉCOUVERT.

TABLEAU

indiquant les prix de transit pour les correspondances transmises à découvert
par l'Office des Postes d ——
à l'Office des Postes d ——

N° d'ordre.	Pays de destination ou de sortie.	Prix de transit par kilogramme			Observations.
		de lettres.	de journaux etc.	pour le parcours par	
1	2	3	4	5	6
		Fr.	*Cs.*		

Despatching Office ——. **F.** *Receiving re-forwarding Office* ——.

OPEN TRANSIT.

TABLE

showing the rates of transit for the correspondence transmitted in open mails
by the Postal Office of ——
to the Postal Office of ——

Nos. of order.	Country of destination or of departure.	Transit rate per kilogram—			Observations.
		on letters.	on newspapers, &c.	for the conveyance through	
1	2	3	4	5	6
		Fr.	*Cs.*		

Office Expéditeur G. *Office destinataire réexpéditeur*

TRANSIT A DÉCOUVERT.

DÉPÊCHE

du bureau d'échange d ——

pour le bureau d'échange d ——

expédiée le —— 187— *à* —— *h.* ——*m. du* ——

Nos. d'ordre.	Pays de destination ou de sortie.	Prix de transit par kilogramme		Déclaration du bureau d'échange expéditeur.		Vérification du bureau d'échange destinataire.	
		de lettres.	de journaux etc.	Lettres.	Journaux etc.	Lettres.	Journaux etc.
1	2	3	4	5	6	7	8
		Fr.	*Cs.*	*Grammes.*	*Grammes.*	*Grammes.*	*Grammes.*

Despatching Office ——. G. *Receiving re-forwarding Office* ——.

OPEN TRANSIT.

MAIL

from the exchange office of ——
for the exchange office of ——
sent the ——, 187—, *at* —— *o'clock of the* ——.

Nos. of order.	Country of destination or of departure.	Rate of transit per kilogram—		Statement of the despatching exchange office.		Verification from the receiving exchange office.	
		on letters.	on newspapers, &c.	Letters.	News-papers, &c.	Letters.	News-papers, &c.
1	2	3	4	5	6	7	8
		Fr.	*Cs.*	*Grams.*	*Grams.*	*Grams.*	*Grams.*

expéditeur **H.** *Office destinataire*

TRANSIT CLOS.

Dépêches du bureau d'échange ——
pour le bureau d'échange ——
expédiées en transit par ——

Dates.	DÉPÊCHE du bureau d'échange —— pour le bureau d'échange ——		DÉPÊCHE du bureau d'échange —— pour le bureau d'échange ——		DÉPÊCHE du bureau d'échange —— pour le bureau d'échange ——	
	Poids net.		Poids net.		Poids net.	
	Lettres.	Journaux etc.	Lettres.	Journaux etc.	Lettres.	Journaux etc.
1	2	3	4	5	6	7
	Grammes.	*Grammes.*	*Grammes.*	*Grammes.*	*Grammes.*	*Grammes.*
aux						

—— le —— 187—
Le chef du bureau d'échange destinataire :

Vu et accepté :
—— le —— 187—
Le chef du bureau d'échange expéditeur:

Despatching Office H. *Receiving Office*

CLOSED TRANSIT.

Mails from the exchange office of ——
for the exchange office of ——
sent in transit through ——.

Dates.	MAIL from the exchange office of —— to the exchange office of ——.		MAIL from the exchange office of —— to the exchange office of ——.		MAIL from the exchange office of —— to the exchange office of ——.	
	Net weight.		Net weight.		Net weight.	
	Letters.	Newspapers, &c.	Letters.	Newspapers, &c.	Letters.	Newspapers, &c.
1	2	3	4	5	6	7
	Grams.	*Grams.*	*Grams.*	*Grams.*	*Grams.*	*Grams.*
Totals						

—— the ——, 187—
Chief of receiving exchange office:

Examined and accepted:
—— the ——, 187—
Chief of despatching exchange office:

AMENDED ARTICLE TO REPLACE ARTICLE THREE OF THE POSTAL CONVENTION BETWEEN THE UNITED STATES OF AMERICA AND THE COLONIAL GOVERNMENT OF NEW SOUTH WALES, SIGNED AT WASHINGTON THE 15TH DAY OF JANUARY, A. D. 1874.

The undersigned being thereunto duly authorized by their respective Governments, have agreed to replace Article 3 of the Postal Convention of 15th January, 1874, by the following article.

ARTICLE 3.

No accounts shall be kept between the Post Departments of the two countries upon the international correspondence, written or printed, exchanged between them, but each country shall retain to its own use the postage which it collects.

The single rate of international letter-postage shall be 12 cents in the United States, and sixpence in New South Wales, on each letter weighing half an ounce or less, and an additional rate of 12 cents (sixpence) for each single weight of half an ounce or fraction thereof, which shall in all cases be prepaid at least one single rate, by means of postage-stamps, at the office of mailing in either country. Letters unpaid, or prepaid less than one full rate of postage shall not be forwarded, but insufficiently paid letters on which a single rate or more has been prepaid, shall be forwarded, charged with the deficient postage to be collected and retained by the Post Department of the country of destination.

The United States Post Office shall levy and collect to its own use, on newspapers addressed to New South Wales, a postage charge of 2 cents; and on all other articles of printed matter, patterns and samples of merchandise addressed to New South Wales, a postage charge of 4 cents per each weight of four ounces or fraction of four ounces.

The Post Office of New South Wales shall levy and collect to its own use, on newspapers and other articles of printed matter, patterns and samples of merchandise addressed to the United States, the regular rates of domestic postage chargeable thereon by the laws and regulations of the Colony of New South Wales.

Letters, newspapers, and other articles of printed matter, patterns and samples of merchandise, fully prepaid, which may be received in either country from the other, shall be delivered free of all charge whatever.

Newspapers, and all other kinds of printed matter, and patterns and samples of merchandise are to be subject to the laws and regulations of each country respectively, in regard to their liability to be rated with letter-postage when containing written matter, or for any other cause specified in said laws and regulations, as well as in regard to their liability to customs-duty under the revenue laws.

The provisions of this amended article shall be carried into operation on the 1st of July, A. D. 1875.

Done in duplicate and signed at Washington the twentieth day of July, 1875, and at Sydney the first day of June, 1875.

[L. S.] MARSHALL JEWELL,
Postmaster General of the United States.

[L. S.] J. T. BURNS,
Postmaster General of New South Wales.

I hereby approve the aforegoing amended article and in testimony thereof I have caused the seal of the United States to be affixed.

[L. S.] U. S. GRANT.

By the President:
HAMILTON FISH,
Secretary of State.

WASHINGTON, *July* 29, 1875.

POSTAL ARRANGEMENT BETWEEN THE UNITED STATES AND THE DOMINION OF CANADA.

The Post-Office Department of the United States of America, and the Post-Office Department of the Dominion of Canada, being desirous of effecting, by means of a new arrangement, the unification of the postal systems of the United States and Canada, in respect to correspondence exchanged between them, the undersigned, duly authorized for that purpose by their respective governments, have agreed upon the following articles:

ARTICLE I.

Correspondence of every kind, written and printed, embracing letters, postal cards, newspapers, pamphlets, magazines, books, maps, plans, engravings, drawings, photographs, lithographs, sheets of music, &c., and patterns and samples of merchandise, including grains and seeds, mailed in the United States and addressed to Canada, or, *vice versa*, mailed in Canada and addressed to the United States, shall be fully prepaid at the domestic postage rates of the country of origin, and the country of destination will receive, forward, and deliver the same free of charge.

ARTICLE II.

Each country will transport the domestic mails of the other by its ordinary mail-routes, in closed pouches, through its territory, free of charge.

ARTICLE III.

Patterns and samples of merchandise not exceeding the weight of eight ounces may be exchanged in the mails between the two countries, under such regulations in regard to the forwarding and delivery of the same as either of the Post-Office Departments shall prescribe, to prevent violations of the revenue laws. They must never be closed against inspection, but must always be so wrapped or inclosed that they may be readily and thoroughly examined by postmasters. The postage on each pattern or sample shall be ten cents, prepayment obligatory.

ARTICLE IV.

No accounts shall be kept between the Post-Office Departments of the two countries in regard to international correspondence of any kind

exchanged between them, but each department will retain to its exclusive use all the postage it collects on mail-matter of every kind sent to the other for delivery.

ARTICLE V.

The Post-Office Departments of the United States and Canada shall each return tc the other all dead letters, unopened and without charge, monthly or oftener, as may best suit the regulations of each department.

ARTICLE VI.

The expense of transporting the mails between the frontier exchange offices, where the conveyance is by water, shall be borne equally by the two departments; but when the transportation is by land, the expense shall be borne by each in proportion to the distance traveled over the territory of each country. All contracts for such transportation shall, before they go into operation, be approved by the Post-Office Department of each country.

ARTICLE VII.

All offices now exchanging mails shall continue to act as offices of exchange under this convention. The two departments may at any time, by mutual agreement, discontinue any of said offices of exchange, or establish others.

ARTICLE VIII.

The existing arrangement for the exchange of registered letters between the two countries shall continue in full force; but the registration-fee on registered letters sent from the United States to Canada, shall be the same as the registration-fee charged in the United States for domestic registered letters.

ARTICLE IX.

This arrangement, except so far as it relates to letter-postage, shall take effect from the first day of January, 1875. The reduced letter-rate will come into operation on the first of February, 1875. It shall continue in force until terminated by mutual agreement; and it may be annulled at the desire of either Department, upon six months' previous notice given to the other.

Done in duplicate, and signed at Washington the first day of February, 1875, and at Ottawa the 27th day of January, 1875.

[SEAL.] MARSHALL JEWELL,
Postmaster-General of the United States.

[SEAL.] D. A. MACDONALD,
P. M. G., Canada.

I hereby approve the aforegoing postal arrangement, and, in testimony thereof, I have caused the seal of the United States to be affixed.

[SEAL.] U. S. GRANT.

By the President:
HAMILTON FISH,
Secretary of State.

WASHINGTON, *February* 1, 1875.

AGREEMENT BETWEEN THE UNITED STATES OF AMERICA AND THE EMPIRE OF JAPAN, FOR THE PREPAYMENT IN FULL TO DESTINATION OF THE POSTAGE ON NEWSPAPERS AND OTHER ARTICLES OF PRINTED MATTER, PATTERNS AND SAMPLES OF MERCHANDISE EXCHANGED IN THE MAILS BETWEEN THE TWO COUNTRIES.

The undersigned being thereunto duly authorized by their respective Governments have agreed to replace the fourth and fifth paragraphs of Article III of the Postal Convention between the United States of America and the Empire of Japan signed at Washington on the 6th day of August A. D. 1873, or the sixth day of the eighth month of the sixth year of Meiji, with the following paragraph, viz:

"There shall be levied, collected and retained to its own use by the post office of the country of origin an international postage of 4 cents, or 4 sen on each newspaper, not exceeding four ounces in weight, and of 4 cents or 4 sen for each weight of two ounces or fraction of two ounces on all other articles of printed matter, patterns and samples of merchandise, which postage shall be in full of all charges to destination in the country of delivery."

This agreement shall be carried into operation on the 1st day of July A. D. 1875, or the first day of the seventh month of the eighth year of Meiji, and shall supersede from that date the fourth and fifth paragraphs of Article III of the aforesaid Convention.

Done in duplicate and signed at Washington this twenty-sixth day of April one thousand eight hundred and seventy-five.

[L. S.] MARSHALL JEWELL,
Postmaster General of the United States.
YOSHIDA KIYONARI
His Imperial Japanese Majesty's Envoy Extraordinary and Minister Plenipotentiary to the U. S. of America.

I hereby approve the aforegoing Agreement and in testimony thereof I have caused the seal of the United States to be affixed.

[L. S.] U. S. GRANT.

By the President:
HAMILTON FISH
Secretary of State

WASHINGTON, *April* 27, 1875.

[Translation.]

I hereby approve the foregoing Agreement, and in testimony thereof I have caused the seal of the Empire of Japan to be affixed.

[L. S.] MUTSUHITO.

The 15th day of the 6th month of the 8th year, Meiji.

By order of His Majesty

TERASHIMA MUNENORI,
Minister for Foreign Affairs.

Total operations of the appointment-office for the year ended June 30, 1875.

tes and Territories.	Post-offices.				Postmasters.			Total number of cases.
	Established.	Discontinued.	Names and sites changed.	Appointments on change of names and sites.	Resigned and commissions expired.	Removed.	Deceased.	
.....	82	43	10	4	165	31	8	339
.....	.....	2	.....	.....	.....	.....	.....	2
.....	10	2	.....	.....	12	3	.....	27
.....	116	53	9	3	132	42	6	358
.....	72	24	12	6	138	13	8	267
.....	29	8	4	2	41	12	4	98
ut.....	2	3	1	.....	51	3	6	66
.....	30	7	3	.....	44	11	3	98
.....	2	2	.....	.....	10	2	2	18
f Columbia.....	1	.....	.....	.....	.....	.....	.....	1
.....	40	15	8	2	48	12	1	124
.....	84	25	6	2	141	16	6	278
.....	6	7	.....	.....	16	2	1	32
.....	86	51	22	4	359	34	13	565
.....	47	31	7	3	354	37	21	497
.....	54	39	15	7	251	51	9	419
.....	133	50	24	16	250	39	8	504
.....	90	59	10	4	207	30	19	415
.....	43	23	5	2	82	48	8	209
.....	24	12	2	1	98	9	12	157
.....	33	8	11	6	61	8	12	133
setts.....	6	13	3	1	86	2	10	120
.....	60	26	14	5	188	43	12	343
.....	56	25	12	7	135	28	6	262
.....	32	9	7	3	104	23	3	178
.....	138	62	16	7	304	52	23	595
.....	13	7	1	.....	18	6	.....	45
.....	82	25	27	17	99	23	3	259
.....	7	5	.....	.....	21	6	2	41
pshire	11	4	.....	.....	43	2	8	68
sy.....	28	9	2	.....	86	12	6	143
ico	15	4	1	.....	16	3	.....	39
.....	42	28	16	9	344	69	29	528
olina	124	49	13	3	176	24	6	392
.....	55	31	23	7	308	45	20	482
.....	38	13	7	3	55	3	5	121
nia.....	78	37	33	16	427	57	32	664
and	1	.....	.....	.....	20	2	.....	23
olina.....	58	29	5	3	100	14	2	208
.....	100	43	11	5	161	36	9	360
.....	92	49	20	7	199	37	12	409
.....	11	6	3	1	22	5	1	48
.....	2	.....	2	1	53	4	10	71
.....	130	65	32	13	241	35	19	522
on	20	4	5	2	31	1	.....	61
ginia.....	66	34	9	3	112	13	2	236
.....	55	16	20	12	194	23	13	321
.....	9	3	.....	.....	14	3	.....	29
l	2,313	1,060	431	187	6,017	974	380	11,175

Statement of the operations of the free-delivery

Post-offices.	Number of carriers in service June 30, 1875.	Delivered.				
		Mail.		Local.		Newspapers.
		Letters.	Postal cards.	Letters.	Postal cards.	
Albany, N. Y	25	1, 900, 708	199, 076	240, 992	142, 410	964, 852
Allegheny, Pa	11	951, 995	64, 011	86, 170	27, 067	536, 936
Atlanta, Ga	6	654, 194	86, 157	29, 580	29, 149	241, 989
Baltimore, Md	60	5, 364, 437	438, 442	796, 226	444, 082	1, 612, 779
Bangor, Me	5	230, 473	28, 012	14, 113	3, 698	126, 004
Boston, Mass	146	10, 853, 982	1, 322, 070	4, 250, 955	1, 257, 411	4, 057, 334
Bloomington, Ill	6	333, 673	64, 266	27, 663	12, 077	228, 473
Brooklyn, N. Y	86	4, 565, 021	508, 525	914, 360	426, 469	2, 386, 417
Buffalo, N. Y	34	3, 305, 971	245, 779	334, 333	186, 609	1, 486, 117
Burlington, Iowa	6	406, 150	42, 913	27, 424	17, 489	331, 954
Camden, N. J	6	357, 618	44, 831	42, 178	17, 568	194, 430
Charleston, S. C	8	385, 954	37, 069	36, 787	19, 842	208, 878
Chicago, Ill	144	15, 654, 751	1, 552, 405	2, 777, 682	1, 018, 208	4, 132, 003
Cincinnati, Ohio	63	5, 319, 691	555, 469	912, 993	411, 785	1, 360, 514
Cleveland, Ohio	30	3, 247, 536	458, 741	419, 189	173, 691	1, 392, 709
Columbus, Ohio	12	785, 288	105, 831	64, 736	41, 690	428, 374
Covington, Ky	4	240, 906	23, 828	14, 121	3, 938	131, 858
Davenport, Iowa	7	382, 819	77, 140	29, 343	26, 788	250, 076
Dayton, Ohio	12	1, 025, 453	124, 828	94, 187	50, 432	529, 706
Detroit, Mich	31	4, 206, 955	471, 308	431, 518	113, 675	1, 748, 046
Dubuque, Iowa	5	359, 211	55, 036	16, 887	15, 040	262, 891
Des Moines, Iowa	6	424, 101	67, 638	36, 375	18, 490	273, 399
Easton, Pa	6	560, 014	72, 301	38, 773	14, 034	237, 699
Elizabeth, N. J	6	451, 962	45, 562	62, 326	11, 611	289, 593
Elmira, N. Y	6	540, 209	70, 527	41, 841	13, 578	223, 856
Erie, Pa	7	585, 528	36, 053	57, 171	27, 247	442, 218
Evansville, Ind	7	485, 968	68, 542	22, 004	18, 146	370, 901
Fort Wayne, Ind	7	937, 336	75, 509	108, 965	62, 859	606, 936
Fall River, Mass	8	309, 541	19, 637	28, 932	8, 927	218, 885
Grand Rapids, Mich	8	960, 012	122, 993	94, 042	29, 114	520, 028
Harrisburgh, Pa	5	362, 919	45, 408	24, 634	10, 240	273, 288
Hartford, Conn	11	833, 252	94, 558	147, 044	55, 324	545, 543
Hoboken, N. J	4	213, 336	27, 700	16, 492	14, 417	68, 197
Indianapolis, Ind	26	2, 420, 374	288, 471	243, 391	129, 971	910, 549
Jersey City, N. J	14	1, 244, 260	77, 639	122, 018	46, 889	396, 466
Kansas City, Mo	11	1, 197, 572	126, 722	75, 956	36, 289	637, 392
La Fayette, Ind	4	320, 587	53, 830	20, 941	4, 177	249, 133
Lancaster, Pa	5	457, 351	49, 755	23, 004	14, 283	238, 078
Lawrence, Mass	8	670, 861	32, 748	34, 317	35, 778	483, 478
Leavenworth, Kans	5	322, 607	50, 861	23, 400	15, 644	184, 377
Louisville, Ky	29	2, 751, 877	326, 021	265, 479	216, 221	955, 127
Lowell, Mass	10	610, 770	54, 900	50, 287	28, 959	275, 378
Lynn, Mass	7	485, 165	60, 416	31, 757	31, 946	238, 395
Manchester, N. H	7	515, 482	69, 889	27, 823	24, 577	408, 065
Memphis, Tenn	13	1, 337, 721	82, 441	84, 543	46, 970	354, 025
Milwaukee, Wis	26	3, 063, 557	208, 957	205, 314	168, 060	735, 404
Minneapolis, Minn	8	671, 966	50, 435	44, 629	27, 069	506, 398
Mobile, Ala	6	215, 183	19, 376	16, 425	5, 181	171, 871
Nashville, Tenn	11	991, 289	104, 233	67, 255	30, 727	515, 970
Newark, N. J	23	1, 645, 254	242, 877	400, 200	152, 452	825, 425
New Bedford, Mass	6	736, 555	30, 582	26, 331	14, 442	364, 016
New Haven, Conn	14	764, 369	73, 361	112, 461	39, 545	496, 405
New Orleans, La	47	2, 617, 851	284, 534	458, 590	268, 817	1, 211, 398
New York, N. Y	429	34, 140, 620	3, 283, 271	20, 435, 013	5, 162, 732	7, 651, 516
Norfolk, Va	6	438, 047	77, 609	33, 361	25, 686	164, 808
Omaha, Neb	6	521, 209	77, 713	55, 307	19, 603	294, 175
Oswego, N. Y	6	389, 756	50, 111	26, 469	6, 718	189, 305
Paterson, N. J	7	384, 924	30, 532	43, 738	17, 803	208, 006
Peoria, Ill	8	481, 647	79, 054	29, 774	17, 503	234, 158
Petersburgh, Va	5	332, 339	46, 242	20, 975	11, 254	138, 692
Philadelphia, Pa	227	17, 239, 000	1, 813, 877	9, 364, 499	2, 453, 602	7, 783, 302
Pittsburgh, Pa	34	2, 376, 914	185, 725	366, 201	140, 609	955, 871
Portland, Me	10	587, 731	81, 584	45, 712	35, 830	479, 140
Pottsville, Pa	4	250, 570	31, 595	23, 119	4, 636	204, 041
Poughkeepsie, N. Y	6	441, 306	35, 542	36, 198	22, 625	259, 376
Providence, R. I	21	972, 639	91, 593	232, 024	48, 400	461, 240
Quincy, Ill	7	445, 601	79, 839	31, 180	19, 959	370, 439
Reading, Pa	9	527, 200	63, 240	50, 230	22, 232	304, 156
Richmond, Va	16	1, 203, 579	138, 547	87, 813	58, 333	464, 155
Rochester, N. Y	23	2, 753, 985	148, 048	189, 346	154, 149	1, 067, 569
Saint Joseph, Mo	7	464, 612	56, 536	27, 754	11, 688	332, 456
Saint Louis, Mo	100	9, 431, 997	802, 998	1, 050, 667	698, 904	2, 695, 276
Saint Paul, Minn	10	816, 381	84, 634	45, 738	26, 291	5 8. 707

system for the year ending June 30, 1875.

Collected.			Pieces handled.		Cost of service, (including incidental expenses.)			Amount of local postage.
Letters.	Postal cards.	Newspapers.	Aggregate.	Per carrier.	Aggregate.	Per piece.	Per carrier.	
						Mills.		
1, 854, 471	186, 516	245, 593	5, 734, 618	229, 385	$21, 182 44	3. 69	$847 30	$7, 861 49
484, 137	53, 623	52, 951	2, 256, 890	205, 172	8, 580 37	3. 80	780 03	5, 897 79
388, 169	69, 468	39, 232	1, 537, 938	256, 323	3, 724 54	2. 42	620 76	1, 769 42
5, 049, 315	785, 251	255, 837	14, 746, 369	245, 773	58, 910 08	3. 93	981 83	28, 216 86
317, 505	50, 810	35, 478	806, 093	161, 219	3, 301 08	4. 10	660 22	825 21
17, 511, 101	2, 101, 300	2, 582, 908	43, 937, 061	300, 939	112, 457 67	2. 56	770 26	132, 657 36
179, 723	47, 241	16, 833	909, 949	151, 658	3, 765 52	4. 14	627 59	1, 295 26
2, 834, 817	512, 058	348, 824	12, 496, 491	145, 308	79, 320 06	6. 35	922 33	57, 097 84
2, 274, 269	347, 410	264, 872	8, 445, 360	248, 393	32, 695 91	3. 87	961 64	10, 745 63
317, 240	50, 312	108, 038	1, 301, 520	216, 920	3, 649 44	2. 80	608 24	1, 038 68
179, 289	23, 678	17, 518	877, 110	146, 185	4, 011 31	4. 57	668 55	1, 419 59
343, 697	42, 436	37, 456	1, 112, 119	139, 015	5, 590 60	5. 03	698 83	2, 373 55
20, 711, 337	3, 221, 669	4, 620, 246	53, 688, 301	372, 835	135, 116 10	2. 52	938 31	69, 009 89
3, 273, 229	532, 046	270, 288	12, 636, 015	200, 572	59, 803 06	4. 73	949 25	42, 884 90
2, 393, 773	490, 488	265, 784	8, 841, 911	294, 730	29, 789 02	3 37	992 97	13, 669 05
578, 288	117, 877	57, 283	2, 179, 367	181, 614	8, 019 78	3. 68	668 32	3, 402 42
106, 209	10, 884	11, 023	542, 767	135, 692	2, 609 58	4. 81	652 40	536 71
242, 150	45, 340	30, 082	1, 083, 738	154, 820	4, 834 69	4. 46	690 67	1, 284 22
853, 726	205, 488	318, 255	3, 202, 075	266, 840	9, 462 43	2. 96	788 54	2, 794 41
2, 214, 785	370, 713	205, 022	9, 762, 022	314, 904	27, 813 47	2. 85	897 21	10, 932 51
343, 894	85, 081	45, 837	1, 183, 877	236, 775	3, 332 52	2. 81	666 50	910 49
296, 688	54, 377	40, 375	1, 211, 443	201, 907	4, 120 10	3. 40	686 68	1, 438 53
481, 733	62, 497	231, 388	1, 698, 439	283, 073	4, 528 56	2. 67	754 76	1, 147 26
308, 865	29, 814	22, 928	1, 222, 661	203, 777	4, 162 30	3. 40	693 72	1, 555 99
242, 473	36, 554	20, 053	1, 189, 091	198, 182	3, 816 55	3. 21	636 09	1, 503 40
274, 631	33, 419	14, 880	1, 471, 147	210, 164	5, 870 27	3. 99	838 61	2, 109 87
337, 252	70, 946	30, 082	1, 403, 841	200, 549	4, 539 69	3. 23	648 53	863 91
906, 317	96, 246	108, 849	2, 903, 017	414, 717	4, 353 26	1. 50	621 89	3, 843 37
182, 160	13, 905	33, 266	815, 253	101, 907	5, 176 00	6. 35	647 00	1, 635 22
613, 596	88, 983	72, 033	2, 500, 799	312, 600	5, 012 96	2. 00	626 62	3, 553 87
132, 074	17, 903	11, 196	877, 662	175, 532	3, 633 40	4. 14	726 68	1, 541 05
528, 843	73, 871	52, 011	2, 330, 446	211, 859	8, 759 06	3. 76	796 28	6, 230 04
77, 188	15, 379	4, 911	437, 620	109, 405	2, 599 74	5. 94	649 94	638 68
1, 627, 669	370, 776	181, 829	6, 173, 030	237, 424	20, 550 13	3. 33	790 39	8, 088 61
518, 665	71, 318	87, 264	2, 564 519	183, 180	10, 678 00	4. 20	762 71	6, 256 05
631, 426	109, 328	98, 155	2, 912, 840	264, 804	7, 681 94	2. 64	698 36	5, 359 08
208, 856	40, 140	17, 029	914, 693	228, 673	2, 665 40	2. 91	666 35	762 47
127, 661	16, 998	19, 176	946, 306	189, 261	4, 627 72	4. 89	925 54	861 95
632, 353	49, 525	53, 092	1, 992, 152	249, 019	6, 960 50	3. 49	870 06	1, 744 67
282, 570	52, 536	31, 097	963, 092	192, 618	3, 045 38	3. 16	609 08	986 05
1, 608, 049	266, 174	221, 691	6, 630, 639	228, 643	27, 904 78	4. 21	962 23	9, 117 95
693, 100	68, 782	40, 899	1, 823, 075	182, 308	6, 595 64	3. 62	659 56	2, 716 50
349, 249	60, 386	37, 022	1, 294, 336	184, 905	6, 302 95	4. 87	900 42	1, 499 24
254, 166	38, 761	57, 654	1, 396, 417	199, 488	6, 294 71	4. 51	899 24	1, 053 06
776, 387	95, 143	105, 575	2, 882, 805	221, 754	9, 498 99	3. 30	730 69	2, 365 56
1, 592, 542	257, 079	156, 580	6, 387, 493	245, 673	23, 119 66	3. 62	889 22	14, 139 93
486, 584	59, 000	55, 268	1, 961, 349	245, 169	5, 761 80	2. 94	720 23	3, 162 90
283, 955	23, 185	67, 696	802, 872	133, 812	3, 857 07	4. 80	642 85	1, 791 84
565, 763	104, 032	59, 996	2, 439, 265	221, 751	9, 662 00	3. 96	878 36	1, 952 41
1, 019, 895	154, 642	128, 247	4, 568, 990	198, 652	20, 779 87	4. 55	903 47	11, 040 73
297, 750	32, 336	16, 116	1, 518, 128	253, 021	5, 042 43	3. 32	840 41	1, 366 78
594, 558	66, 198	80, 226	2, 227, 123	159, 080	11, 298 14	5. 07	807 01	6, 364 36
4, 063, 205	482, 765	1, 208, 125	10, 595, 286	225, 432	39, 545 88	3. 73	841 40	28, 044 24
53, 231, 340	8, 105, 825	5, 503, 527	137, 513, 844	320, 545	358, 602 00	2. 61	835 90	1, 003, 698 09
525, 820	77, 614	44, 399	1, 387, 344	231, 224	4, 034 54	2. 91	672 42	1, 489 09
359, 613	65, 171	33, 437	1, 426, 228	237, 705	4, 217 25	2. 96	702 88	1, 923 43
297, 624	46, 802	22, 959	1, 029, 744	171, 624	4, 088 05	3. 97	681 34	748 16
207, 862	24, 967	36, 224	954, 056	136, 294	5, 101 67	5. 35	728 81	1, 483 32
513, 524	102, 254	61, 446	1, 519, 360	189, 920	5, 556 52	3. 66	694 57	1, 342 02
220, 817	31, 184	13, 471	814, 974	162, 995	3, 228 51	3. 96	645 70	703 75
21, 961, 428	3, 259, 294	3, 996, 445	67, 871, 447	298, 993	218, 989 04	3. 23	964 71	236, 002 29
1, 774, 272	203, 920	177, 996	6, 181, 508	181, 809	24, 536 14	3. 97	721 65	15, 719 36
778, 819	131, 219	73, 214	2, 213, 249	221, 325	8, 792 96	3. 97	879 30	3, 269 85
134, 642	18, 204	58, 103	724, 910	181, 228	2, 657 53	3. 67	664 38	943 59
492, 268	60, 267	125, 145	1, 472, 727	245, 455	3, 567 04	2. 42	594 51	1, 923 31
438, 369	43, 073	17, 245	2, 304, 583	109, 742	14, 401 57	6. 25	685 79	13, 435 57
284, 919	71, 950	50 343	1, 354, 211	193, 459	5, 212 87	3. 85	744 70	1, 383 16
293, 878	38, 653	16, 870	1, 316, 459	146, 273	7, 089 36	5. 39	787 71	1, 800 56
710, 953	107, 171	81, 798	2, 852, 349	178, 272	12, 204 66	4. 28	762 79	3, 200 88
2, 274, 257	206, 891	154, 763	6, 949, 008	302, 131	17, 854 96	2. 57	776 30	8, 553 18
360, 390	76, 702	80, 242	1, 410, 380	201, 483	3, 897 17	2. 76	556 74	1, 518 05
5, 989, 528	1, 088, 019	1, 638, 373	23, 395, 762	233, 958	95, 096 89	4. 06	950 97	32, 296 46
772, 391	141, 933	88, 528	2, 494, 603	249, 460	6, 292 64	2. 52	629 26	2, 530 57

Statement of the operations of the free-delivery system

Post-offices.	Number of carriers in service June 30, 1875.	Delivered.				
		Mail.		Local.		Newspapers.
		Letters.	Postal cards.	Letters.	Postal cards.	
Salem, Mass	6	346, 863	43, 235	32, 240	20, 426	249, 829
San Francisco, Cal	36	2, 407, 996	148, 066	747, 910	357, 425	922, 547
Savannah, Ga	6	417, 831	59, 189	55, 261	15, 586	180, 730
Springfield, Mass	8	766, 070	89, 860	100, 912	28, 048	290, 171
Springfield, Ill	4	308, 626	45, 594	21, 569	14, 466	224, 700
Syracuse, N. Y	17	1, 681, 585	181, 229	155, 323	113, 710	828, 194
Toledo, Ohio	13	1, 330, 378	131, 310	116, 028	73, 927	575, 421
Trenton, N. J	6	389, 249	39, 176	31, 335	16, 063	231, 160
Troy, N. Y	15	1, 678, 082	213, 534	199, 634	92, 485	741, 750
Utica, N. Y	13	1, 056, 532	148, 164	92, 296	42, 023	472, 394
Washington, D. C	37	2, 398, 138	188, 913	321, 090	124, 226	1, 114, 282
Wheeling, W. Va	5	564, 407	72, 294	32, 892	13, 460	328, 995
Wilmington, Del	9	634, 815	69, 045	75, 534	31, 259	282, 866
Worcester, Mass	11	665, 224	85, 453	87, 938	63, 449	344, 838
Total aggregates and averages	2, 195	179, 083, 468	18, 313, 565	48, 839, 237	16, 026, 212	68, 454, 476
Salary of special agents of the Post-Office Department paid out of appropriation for letter-carriers						
Two large-sized letter-carrier satchels furnished post-office at Bridgeport, Conn						
Total						

for the year ending June 30, 1875—Continued.

Collected.			Pieces handled.		Cost of service, (including incidental expenses.)			Amount of local postage.
Letters.	Postal cards.	Newspapers	Aggregate.	Per carrier.	Aggregate.	Per piece.	Per carrier.	
						Mills.		
279, 352	39, 250	75, 603	1, 086, 798	181, 133	$5, 276 00	4. 85	$879 33	$1, 242 09
4, 031, 811	491, 654	545, 523	9, 652, 932	268, 137	37, 920 46	3. 93	1, 053 35	30, 995 27
378, 195	59, 563	34, 697	1, 201, 052	200, 175	4, 077 49	3. 39	679 58	1, 976 44
474, 704	63, 914	50, 160	1, 853, 839	231, 730	5, 336 66	2. 88	667 08	3, 572 75
146, 716	31, 210	43, 763	836, 644	209, 161	2, 700 65	3. 23	675 16	879 50
991, 834	180, 262	148, 585	4, 280, 722	251, 807	13, 810 20	3. 23	812 36	4, 729 31
1, 142, 585	285, 406	194, 850	3, 849, 905	296, 147	11, 246 23	2. 92	865 09	4, 183 78
300, 972	32, 668	24, 869	1, 065, 492	177, 582	4, 121 48	3. 87	686 91	2, 134 56
1, 294, 237	192, 186	297, 871	4, 709, 779	313, 985	12, 108 10	2. 57	807 21	5, 316 44
855, 168	151, 761	71, 074	2, 889, 412	222, 262	11, 071 73	3. 83	851 67	2, 999 39
1, 696, 964	187, 175	255, 857	6, 286, 645	169, 909	34, 555 05	5. 50	933 92	15, 258 06
563, 507	81, 831	65, 830	1, 723, 216	344, 643	3, 388 55	1. 97	677 71	1, 158 63
290, 387	54, 780	17, 460	1, 456, 146	161, 794	8, 393 33	5. 76	932 59	2, 617 57
434, 148	68, 008	35, 668	1, 784, 726	162, 248	8, 569 86	4. 80	779 08	5, 172 21
187, 950, 641	28, 203, 468	27, 330, 407	574, 201, 474	261, 595	1, 874, 411 71	3. 26	853 95	1, 947, 559 54
.....					5, 622 48			
.....					7 80			
.....					1, 880, 041 99			

Table showing the increase and decrease of post-offices in the several States and Territories; also, the number of post-offices at which appointments are made by the President and by the Postmaster-General for the year ended June 30, 1875.

States and Territories.	Whole number of post-offices in the United States June 30, 1874.	Whole number of post-offices in the United States June 30, 1875.	Increase.	Decrease.	Number of postmasters appointed by the President June 30, 1874.	Number of postmasters appointed by the President June 30, 1875.	Increase.	Decrease.	Number of postmasters appointed by the Postmaster-General June 30, 1874.	Number of postmasters appointed by the Postmaster-General June 30, 1875.	Increase.	Decrease.
Alabama	746	785	39	....	14	17	3	....	732	768	36	....
Alaska	4	2	.....	2	.....	.....	....	....	4	2	.....	2
Arizona	34	42	8	....	2	3	1	....	32	39	7	....
Arkansas	602	663	61	....	7	9	2	....	595	654	59	....
California	683	731	48	....	24	32	8	....	659	699	40	....
Colorado	167	188	21	....	8	9	1	....	159	179	20	....
Connecticut	436	435	.....	1	41	44	3	....	395	391	.....	4
Dakota	112	133	21	....	2	2	....	....	110	131	21	....
Delaware	101	101	.....	....	4	6	2	....	97	95	.....	2
District of Columbia	5	6	1	....	2	2	....	....	3	4	1	....
Florida	181	206	25	....	6	6	....	....	175	200	25	....
Georgia	656	715	59	....	22	23	1	....	634	692	58	....
Idaho	66	68	2	....	2	2	....	....	64	66	2	....
Illinois	1,830	1,865	35	....	127	136	9	....	1,703	1,729	26	....
Indiana	1,478	1,494	16	....	57	67	10	....	1,421	1,427	6	....
Iowa	1,337	1,352	15	....	66	80	14	....	1,271	1,272	1	....
Kansas	981	1,064	83	....	34	38	4	....	947	1,026	79	....
Kentucky	1,031	1,062	31	....	24	28	4	....	1,007	1,034	27	....
Louisiana	318	338	20	....	7	6	....	1	311	332	21	....
Maine	857	869	12	....	23	28	5	....	834	841	7	....
Maryland	581	606	25	....	12	14	2	....	569	592	23	....
Massachusetts	722	715	.....	7	102	100	....	2	620	615	.....	5
Michigan	1,168	1,202	34	....	68	70	2	....	1,100	1,132	32	....
Minnesota	783	814	31	....	18	23	5	....	765	791	26	....
Mississippi	537	560	23	....	23	21	....	2	514	539	25	....
Missouri	1,449	1,525	76	....	46	46	....	....	1,403	1,479	76	....
Montana	94	100	6	....	4	4	....	....	90	96	6	....
Nebraska	501	559	58	....	10	11	4	....	491	545	54	....
Nevada	86	88	2	....	10	9	....	1	76	79	3	....
New Hampshire	427	434	7	....	24	23	....	1	403	411	8	....
New Jersey	635	654	19	....	46	46	....	....	589	608	19	....
New Mexico	55	66	11	....	2	3	1	....	53	63	10	....
New York	2,801	2,815	14	....	156	179	23	....	2,645	2,636	.....	9
North Carolina	970	1,045	75	....	12	13	1	....	958	1,032	74	....
Ohio	2,140	2,164	24	....	100	113	13	....	2,040	2,051	11	....
Oregon	244	268	24	....	5	6	1	....	239	262	23	....
Pennsylvania	3,072	3,113	41	....	120	132	12	....	2,952	2,981	29	....
Rhode Island	103	104	1	....	10	11	1	....	93	93	.....	....
South Carolina	431	460	29	....	13	13	....	....	418	447	29	....
Tennessee	989	1,046	57	....	17	19	2	....	972	1,027	55	....
Texas	818	861	43	....	30	30	....	....	788	831	43	....
Utah	166	171	5	....	3	3	....	....	163	168	5	....
Vermont	482	484	2	....	19	21	2	....	463	463	.....	....
Virginia	1,339	1,404	65	....	22	24	2	....	1,317	1,380	63	....
Washington	138	155	17	....	3	3	....	....	135	152	17	....
West Virginia	714	746	32	....	10	10	....	....	704	736	32	....
Wisconsin	1,190	1,229	39	....	49	56	7	....	1,141	1,173	32	....
Wyoming	34	40	6	....	2	3	1	....	32	37	5	....
Total	34,294	35,547	1,263	10	1,408	1,547	146	7	32,886	34,000	1,136	22

CONVENTION

BETWEEN

THE POSTAL DEPARTMENT OF THE UNITED STATES OF AMERICA AND THE POSTAL DEPARTMENT OF THE DOMINION OF CANADA.

The Postal Department of the United States of America and the Postal Department of the Dominion of Canada being desirous of establishing an exchange of money-orders between the two countries, the undersigned, duly authorized for that purpose, have agreed upon the following articles:

ARTICLE I.

There shall be a regular exchange of money-orders between the two countries for sums received from remitters in one country for payment to beneficiaries in the other.

The maximum of each order is fixed at forty dollars, gold value, when issued in the Dominion of Canada, and when issued in the United States at fifty dollars in the national paper currency of that country, but no money-order shall include the fractional part of a cent.

ARTICLE II.

The Postal Department of the Dominion of Canada shall have the power to fix the rates of commission on all money-orders issued in the Dominion of Canada, and the Postal Department of the United States shall have the same power in regard to all money-orders issued in the United States.

Each Postal Department shall communicate to the other its tariff of charges or rates of commission, and these rates shall, in all cases, be paid in advance by the remitter, who shall not be entitled to repayment thereof. It is understood, moreover, that each department is authorized to suspend temporarily, after having given sixty days' notice of such intention to the other, the exchange of money-orders, in case the course of exchange, or any other circumstances, should give rise to abuses or cause detriment to the postal revenue.

ARTICLE III.

Each country shall keep the commission charged on all money-orders issued within it, but shall pay to the other country one-half of one per cent. on the total amount of such orders.

ARTICLE IV.

The service of the postal money-order system between the two countries shall be performed exclusively through the agency of offices of

exchange, which shall be established in the United States by the Postmaster-General of that country. Eight such offices are hereby designated, viz: Bangor, Me.; Boston, Mass.; New York, Ogdensburgh, and Buffalo, N. Y.; Detroit, Mich.; Saint Paul, Minn., and Portland, Oreg., and the number and location of these offices may be changed from time to time by said Postmaster-General as the interests of the service may require.

ARTICLE V.

Any person in the United States desiring to remit to the Dominion of Canada a sum of money within the limits prescribed by Article I, hereof, may pay it into any post-office in the United States designated from time to time by the Postmaster-General of that country for the transaction of Canadian money-order business. Such person shall, at the same time, give the name and address of the person to whom the amount is to be paid in said Dominion, and also his own name and address.

Any person in the Dominion of Canada, desiring to remit to the United States a sum of money within the same limits, may pay it into any money-order office of said Dominion, designated by the Postmaster-General thereof for said purpose, giving at the same time the name and address of the person to whom the amount is to be paid in the United States, and also his own name and address.

The receiving postmaster in either country shall, in accordance with the rules established by its Postal Department, forward a coupon, an advice, and a money-order to the exchange-office in the United States most convenient to the residence of the beneficiary for whom the money is intended, the postmaster of which exchange-office shall, immediately after the receipt thereof, certify upon the coupon, the advice, and the order, the value of the same in the currency of the country in which payment is to be made, and he shall likewise enter therein the name of the inland office at which the same is to be paid, and shall at once forward the advice to said office, and the order to the beneficiary for whom the money is intended, retaining the coupon on file in his office as a voucher for his own protection and information.

ARTICLE VI.

The money-orders, advices, and coupons issued in each country shall have printed thereón consecutive local or inland numbers, the number upon each advice and coupon being the same as upon its corresponding order; and, in addition thereto, all such orders, advices, and coupons shall be numbered consecutively at the exchange-office at which they are certified, which numbers shall be in the order of their receipt and certification, and shall be designated as "international numbers."

The discovery, by an inland postmaster, of any error in a money-order or advice shall be by him promptly reported to the exchange-office through which the same was certified, and any error coming to the notice of an exchange-office shall at once be reported to the Money-Order Office at Washington, D. C., in order that an explanation or correction may be given or asked for, as the case may be, which explanation or correction shall be afforded with the least possible delay.

ARTICLE VII.

Lists of all orders issued during each week by postmasters in either country for payment in the other, shall, at the close of the week, or as soon thereafter as practicable, be transmitted by the Postal Department of the issuing to that of the paying country, and at the close of

each fiscal quarter two copies of an account shall be prepared and transmitted to the Postal Department of the United States by the Postal Department of the Dominion of Canada, exhibiting the balance found due on the exchanges of money-orders during the quarter, one copy of which, after proper verification and acknowledgment, shall be returned to the Postal Department of the Dominion of Canada. If this verified account shows a balance in favor of the Postal Department of the Dominion of Canada, that of the United States will transmit, with such verified copy of the quarterly account, a bill of exchange on Montreal, Canada, for the amount of said balance, payable to the Postal Department of the Dominion of Canada. The latter will then send an acknowledgment of receipt to the Postal Department of the United States. If, on the other hand, said account, after verification and acknowledgment as aforesaid, shows a balance in favor of the Postal Department of the United States, then the Postal Department of the Dominion of Canada will, upon receipt of the certified copy of the same, transmit to that of the United States a bill of exchange for the amount thereof on New York. The United States Postal Department will then send in return an acknowledgment of receipt.

If, pending the settlement of an account, one of the two Postal Departments shall ascertain that it owes the other a balance exceeding five thousand dollars, the indebted administration shall promptly remit the approximate amount of such balance to the credit of the other. The expenses attending the remittance of bills of exchange shall invariably be borne by the Postal Department having to make the payment.

This account and the letters which accompany such intermediate remittances shall be in accordance with the forms A, B, and C, hereto annexed.

ARTICLE VIII.

Until the two Postal Departments shall consent to an alteration, it is agreed that, in all matters relative to money-orders which shall result from the execution of the present convention, the Canadian dollar shall be considered equivalent to one dollar of the gold coin of the United States, and the exchange-offices in the United States shall certify all orders upon the basis of gold.

ARTICLE IX.

The value, in gold coin, of deposits made in the United States in paper money, for payment to beneficiaries in the Dominion of Canada, and the value, in United States paper money, of deposits made in the Dominion of Canada in gold coin, or currency of par value, for payment in the United States, shall be determined according to the rate of premium on gold in New York, N. Y., in the following manner, viz: The postmaster at New York shall, at three o'clock p. m. of each day, except Sunday, telegraph to each of the above-named exchange-offices in the United States the rate of premium on gold at that hour, which rate shall, when received by such exchange-office, be taken as the basis of conversion of money values for the next and for all subsequent orders and advices dispatched and received, until the receipt of the next telegram from the postmaster at New York.

ARTICLE X.

A duplicate order shall only be issued by the Postal Department of the country on which the original order was drawn, and in conformity with the regulations established or to be established in that country.

ARTICLE XI.

A money-order returned, on application by a dispatching exchange-office, to the inland issuing postmaster, as "not certified for payment," may be repaid by said postmaster to the remitter, in the same manner as a domestic order.

ARTICLE XII.

An order which shall not have been paid within twelve calendar months after the month of its issue shall become void, and the sum received therefor shall accrue to and remain at the disposal of the country of origin, and the advice shall be returned, by the inland postmaster holding the same, to his Postal Department, to be by it returned to the Postal Department of the country in which it originated. The Postal Department of the Dominion of Canada shall, therefore, enter, to the credit of the United States, in the quarterly account, all sums certified from the latter country which remain unpaid at the end of the period specified. On the other hand, the United States Postal Department shall, at the close of each month, transmit to the Postal Department of the Dominion of Canada, for entry in the quarterly account, a detailed statement of all orders dispatched from said Dominion which, under this article, become void.

ARTICLE XIII.

Repayment of an order, not void, to a remitter shall not be made until an authorization therefor shall first have been obtained by the Postal Department of the country of issue from the Postal Department of the country where such order was made payable; and the amount of the repaid order shall be duly credited to the former country in the quarterly account. It is the province of each Postal Department to determine the manner in which repayment to the remitter is to be made

ARTICLE XIV.

The orders drawn by each country upon the other shall be subject, as regards payment, to the regulations which govern the payment of domestic orders in the country on which they are drawn.

ARTICLE XV.

The Postal Department of each country shall be authorized to adopt any additional rules, not repugnant to the foregoing, for greater security against fraud, or for the better working of the system generally. All such additional rules, however, must be promptly communicated to the Postal Department of the other country.

ARTICLE XVI.

The present convention shall take effect on Monday, the 2d day of August, 1875, and shall continue in force until twelve months after the date at which one of the contracting parties shall have notified to the other its intention to terminate it.

Done in duplicate, and signed at Washington, on the eighth day of June, in the year of our Lord one thousand eight hundred and seventy-five, and at Ottawa, Canada, on the twenty-third day of June, in the year of our Lord one thousand eight hundred and seventy-five.

{Seal of the Post-Office Department. of the United States.} (Signed) MARSHALL JEWELL,
Postmaster-General of the United States.

{Seal of the Post-Office Department of the Dominion of Canada.} (Signed) T. FOURNIER,
Postmaster-General of the Dominion of Canada.

I hereby approve the foregoing convention, and in testimony thereof I have caused the seal of the United States to be hereto affixed.

(Signed) U. S. GRANT.

By the President:

{Seal of the United States.} (Signed) JOHN L. CADWALADER,
Acting Secretary of State.

JULY 7, 1875.

INSTRUCTIONS TO POSTMASTERS RELATIVE TO THE SYSTEM OF INTERNATIONAL POSTAL MONEY-ORDERS BETWEEN THE UNITED STATES AND THE DOMINION OF CANADA, WHICH, BY MUTUAL AGREEMENT, IS TO GO INTO OPERATION AUGUST 2, 1875.

1. The exchange of money-orders between the two countries is to be effected through the agency of certain post-offices in the United States, selected for that purpose, to be known as "INTERNATIONAL EXCHANGE-OFFICES."

Eight such exchange-offices have been agreed upon in the foregoing postal convention, viz:

Bangor, Me.	Buffalo, N. Y.
Boston, Mass.	Detroit, Mich.
New York, N. Y.	Saint Paul, Minn.
Ogdensburgh, N. Y.	Portland, Oreg.

2. Certain other money-order post-offices in this country, specially selected for this service by the Postmaster-General, and to be known as "INLAND OFFICES," in distinction from the exchange-offices, are authorized to issue money-orders on any of the above-mentioned international exchange-offices, payable to beneficiaries in the Dominion of Canada, and to pay orders, properly certified by postmasters of such exchange-offices, for sums remitted by postmasters in the Dominion of Canada, for payment to beneficiaries in the United States; but each exchange-office shall also be an inland office, the postmaster at which shall have the right to draw orders on his own or on any other exchange-office for certification in the usual manner. Hence, a postmaster in either country cannot draw an international money-order, for an amount deposited with him, directly upon a postmaster in the other, but must draw the same upon some one of the designated "exchange-offices" most convenient to the residence of the payee or beneficiary for whom the money is intended. An international money-order must not be drawn for a larger sum than *fifty dollars in United States currency*, and must not contain a fractional part of a cent. The fees for the issue of international money-orders are as follows, viz:

On orders not exceeding $10, twenty cents; over $10, and not exceeding $20, forty cents; over $20, and not exceeding $30, sixty cents; over $30, and not exceeding $40, eighty cents; over $40, and not exceeding $50, one dollar. No other currency than United States or national-bank notes can be received or paid in this country.

3. The Canadian dollar is equivalent in value to the gold dollar of the United States, but the issuing postmaster must not undertake to decide definitely upon the actual value, in United States gold coin, (or Canadian money,) of a certain sum in currency for which an international order is issued by him. He is at liberty, however, to advise the remitter as to its approximate value, which may be found to differ materially from the real value, as the latter is to be computed, on the day the order is received by the exchange-office, upon the basis of the premium on gold *in New York*, as last advised by the postmaster of that city. Hence, this Department cannot undertake, on behalf of a remitter in this country, to pay a determinate sum in gold, (or Canadian money,) in the Dominion of Canada. As the premium on gold is variable, it is evident that an international order issued for a sum in United States currency may, when received at such "exchange-office," yield a sum in gold greater or less than that considered at the office of issue as the equivalent of such order. For the same reason, the value in United States currency of an order in gold, when received for certification by any "exchange-office," would depend upon the premium on gold *in New York, on the day of* the receipt of the order, as shown by the last telegraphic advices from the postmaster thereof to such "exchange-office." This Department, therefore, can only agree to cause payment to be made to a beneficiary in the Dominion of Canada of the gold value of any international money-order issued for an amount in United States currency, and to pay to a beneficiary in this country the currency value of an international order in gold from the Dominion of Canada. To guard against misapprehension, postmasters will be careful to explain this point fully to remitters and to payees.

4. A special form of application, form "*No* 1, *Canadian*," must be furnished to each applicant for an international money-order payable in the Dominion of Canada. On this form he must enter all the particulars of the amount, names, address, &c., and must state the *full name*, and *exact residence* of the payee, giving the town or village and county. From the items contained in such application the (inland) issuing postmaster will fill up an international money-order, form "*No.* 12, *Canadian*," the advice of the same, "*No.* 12*a*," the coupon, "*No.* 12*b*," and the receipt, "*No.* 12*d*," all of which, after having been properly dated, and stamped with the money-order stamp of his office, he will forward, *without separating them*, to the international exchange-office nearest the residence of the payee, but he will not undertake to enter upon either of them the name of the post-office in the Dominion of Canada at which such order is to be paid. He will also fill up, detach, and deliver to the remitter of such order the certificate, "*No.* 12*c*." Upon the return to him, from the exchange-office, of the receipt, "*No.* 12*d*," he will place the same on file in his office for reference, should the remitter apply for information as to the gold-value of the order. He will also enter in his "COMBINED REGISTER" of money-orders issued, the particulars of such order, in accordance with the instructions contained in circular "No. 76*g*, Combined," issued June 1, 1875, by the Superintendent of the Money-Order System, and the application must be retained on file at the issuing-office. When an order, drawn by a postmaster in the Dominion of Canada, and properly numbered, dated, certified, stamped, signed,

and addressed to him by the postmaster at a duly-authorized international exchange-office, is presented for payment to the postmaster of an inland office, authorized to transact Canadian business, he will compare such order with the corresponding advice, which should previously have been received by him, and after having satisfied himself, in the manner required for domestic orders, (see sections 839 to 844, inclusive, of the "Postal Laws and Regulations,") that both the advice and order are correct, and that the person presenting the order is legally entitled to receive the amount due thereon, he will pay the same, and will enter all such paid orders upon his combined weekly statement in the manner described in circular No. 76*g*, above referred to. The postmaster issuing a Canadian order should be careful to instruct the sender thereof that he "should at once inform the payee, in Canada, of the full name and address of the remitter," inasmuch as payment thereof cannot be obtained unless the payee is able to furnish that information to the paying postmaster. All applications for duplicates of lost or missing advices, or for corrections of advices, must be made to the exchange-postmaster by whom such advices were certified. The general rules in regard to the issue and payment of domestic orders, contained in the book of "Postal Laws and Regulations," are to be observed in the issue of international money-orders, in so far as these rules are applicable. The postmaster, however, must refuse to issue an order payable to any person, if the surname of that person, and his given name or names, or at least the initial letters thereof, are not furnished by the applicant. If the payee be a firm, the usual designation of such firm will suffice, such as "Baring Bros.," "Smith & Son," "Jones & Co.;" but the mere term "Messrs." such as "Messrs. Rivington," or the name of a company trading under a title which does not consist of the names of the persons composing such company, as, for example, "The Carron Company," must not be accepted as sufficient by the issuing postmaster, who will decline to issue an order for payment in the Dominion of Canada in favor of such payee, as payment thereof would be refused in that country.

5. The postmaster at New York, N. Y., will telegraph at 3 p. m. daily, except Sunday, the rate of premium on gold at that hour in New York, to each of the exchange-offices designated for the certification of international orders to and from Canada.

6. The postmaster at each of said international exchange-offices will, whenever he receives an order, ("No. 12,") with its corresponding "advice," "coupon," and "receipt," stamp AT ONCE upon each of these papers the current international number, and the date of its receipt at his office. He will also enter therein the value of the same in gold, (or Canadian currency,) if such order originated in the United States, or its value in United States currency, if it originated in the Dominion of Canada, as ascertained by calculation, upon the basis of the last telegram received by him from the postmaster at New York, and the name of the post-office in the Dominion of Canada or in the United States, as the case may be, at which he desires the same to be paid, which should be the office nearest the residence of the payee or most accessible by him. He will then forward the order, inclosed in an envelope, to the payee, and the advice to the postmaster instructed to pay the order, and will send back the receipt to the issuing postmaster, but will retain the coupon on file in his office for future reference. At the close of each week he will make up, in duplicate, from the coupons on file in his office, a "weekly list of international money-orders," issued in the United States, which have been certified by him during the week for payment in the Dominion of Canada, and a "weekly list of international money-

orders," issued in the Dominion of Canada, which have been certified by him during the week for payment in the United States, and will forward such duplicate "lists," with his weekly statement, to the Superintendent of the Money-Order System at Washington, D. C. He will also furnish, upon the application of postmasters drawn upon, duplicates of lost advices, which must be made up from the corresponding coupons on file in his office. When the postmaster at an exchange-office receives an application from a paying postmaster for a *corrected advice*, the former will, if necessary, apply to the issuing postmaster for precise information in the premises, and will communicate the same to the postmaster at the office of payment.

Exchange-office postmasters are required to keep on file in their offices the telegrams received daily from New York concerning the premium on gold.

7. When a remitter of an international money-order, payable in the Dominion of Canada or in the United States, makes application to the issuing postmaster for repayment of the amount thereof, the latter should immediately communicate the fact to the postmaster of the exchange-office on which it was drawn, whereupon, if he has not already certified and forwarded the order to the payee, and the advice to the paying postmaster, he will return them to the issuing postmaster for repayment. But if the order (in case it is payable in the Dominion of Canada) has been so certified, the issuing postmaster, upon the receipt of notice to that effect from the exchange-office, will apply to the Superintendent of the Money-Order System at Washington, D. C., for repayment, who will notify the Canadian Postal Department of such application, and request authority for repayment of the order. When that authority is received by him, notice will at once be sent to the issuing postmaster to repay the amount of the order.

8. All orders certified for payment in either country, which for any reason cannot be paid within twelve months after the month of issue, become *invalid*, and will be recertified to the country of issue for repayment or other disposal in accordance with the laws and regulations of that country. Postmasters will, therefore, take care to forward promptly to this Department the advices of all invalid orders of this kind, with their weekly statements, and a description thereof.

9. All inquiries from inland postmasters in the United States concerning the issue or the payment in Canada of international money-orders should be addressed to the postmaster of the exchange-office by which such orders were certified.

10. In case the postmaster who issues an international order does not receive, after a sufficient lapse of time, the corresponding receipt thereof, duly filled up and stamped by the postmaster at the exchange-office drawn upon, the former should send him a letter of inquiry on the subject, with the request that, if the order and advice have not been received at the exchange-office, the latter would transmit to the issuing office, and also to the Superintendent of the Money-Order System at Washington, D. C., a certificate to that effect.. Upon the receipt of such a document, the postmaster who issued the originals should at once draw upon and transmit *to the same exchange-office* a new order, advice, coupon, and receipt in lieu thereof for a like amount, after having *written across the face of each of them* in *red ink* the words "*In lieu of Canadian money-order No.* ——, *not received by the postmaster at* ——— *exchange-office.*" The certificate of non-receipt should be carefully filed by the issuing postmaster, but it is not necessary for him to furnish the remitter with a second receipt. Great caution should be exercised by ex-

change-office postmasters in certifying such orders, as they will be held responsible for all double payments that may occur through their negligence.

11. Postmasters will receive, for transacting the Canadian international money-order business, the following rate of compensation, viz: one-fourth of one per cent. on the gross amount of orders issued and of orders paid. But the annual salary or compensation of a postmaster, from all sources, cannot, except in the case of the postmaster at New York, exceed four thousand dollars.

12. The domestic money-order regulations in regard to incidental expenses, and to the transfer of funds and blanks from a late to a newly-appointed postmaster, are to be followed in the transaction of the Canadian international money-order business.

13. Attention, promptitude, and accuracy on the part of postmasters are essential to the utility and success of an international money-order system.

MARSHALL JEWELL,
Postmaster-General.

JULY 15, 1875.

A.

———————————,
Ottawa, Ont., ———, 18—.

The within account exhibits a total balance of $———, gold, which, after deduction of the payments on account, as therein stated, leaves a balance remaining of $——— due the Postal Department of the ———.

———————————,
———————————.

The above statement of account is accepted with a balance of $——, gold, due the Postal Department of the———————————.

———————————,
Auditor of the Treasury for the Post-Office Department.

WASHINGTON, *D. C.*, ———, 18—.

The payment on account of ——— having been receipted by special vouchers, the receipt of the balance of $———, gold, remaining is hereby acknowledged.

———————————,
———————————.

———————————,
———————18—.

Account of the exchange of money-orders between the Dominion of Canada and the United States during the quarter ended ——— ——, 18—.

Orders issued in the Dominion of Canada.						Orders issued in the United States.					
Total number of orders issued.	Certified by the exchange office at—	Number of the international orders.		Total amount from each exchange office, (gold.)		Total number of orders issued.	Certified by the exchange office at—	Number of the international orders.		Total amount from each exchange office, (gold.)	
		From—	To—	Dolls.	Cts.			From—	To—	Dolls.	Cts.
	Bangor, Me						Bangor, Me				
	Boston, Mass. ..						Boston, Mass.....				
	New York, N. Y..						New York, N. Y..				
	Ogdensburgh, N.Y						Ogdensburgh, N.Y				
	Buffalo, N. Y						Buffalo, N. Y				
	Detroit, Mich						Detroit, Mich				
	Saint Paul, Minn .						Saint Paul, Minn.				
	Portland, Oreg ...						Portland, Oreg ...				
	Total						Total				

BALANCE.

To credit of Canadian postal department.					To credit of United States postal department.				
			Dolls.	Cts.				Dolls.	Cts.
Amount of international orders issued in the United States.....					Amount of international orders issued in the Dominion of Canada...				
One-half of one per cent. on account of such orders					One-half of one per cent. on account of such orders				
Amount of void orders of Canadian issue, as per table					Amount of void orders of United States issue, as per table				
Amount of international orders repaid in the Dominion of Canada, as per table					Amount of international orders repaid in the United States, as per table				
Total.....					Total.....				
United States credit to be deducted ..					Canadian credit to be deducted.....				
Balance to credit of Canadian postal department					Balance to credit of United States postal department.....				
Paid on account by the postal department of the United States.....					Paid on account by the postal department of the Dominion of Canada ..				
	Amounts.					Amounts.			
	Dolls.	Cts.				Dolls.	Cts.		
Balance remaining..	.....	....			Balance remaining..	.....	....		

Table showing the particulars of such orders as have been repaid to the remitters in the country of issue.

Issued in the Dominion of Canada.							Issued in the United States.						
Inland number.	International.		Amount of order.				Inland number.	International.		Amount of order.			
	Number.	Exchange office.	In gold.		In United States paper currency.			Number.	Exchange office.	In United States paper currency.		In gold.	
			Dolls.	Cts.	Dolls.	Cts.				Dolls.	Cts.	Dolls.	Cts.
		To credit of Canadian postal department.....							To credit of United States postal department.....				

Table showing the particulars of such orders as have become void.

Issued in the Dominion of Canada.							Issued in the United States.						
Inland number.	International.		Amount of order.				Inland number.	International.		Amount of order.			
	Number.	Exchange office.	In gold.		In United States paper currency.			Number.	Exchange office.	In United States paper currency.		In gold.	
			Dolls.	Cts.	Dolls.	Cts.				Dolls.	Cts.	Dolls.	Cts.
		To credit of Canadian postal department.....							To credit of United States postal department.....				

B.

No. —. POST-OFFICE DEPARTMENT,
MONEY-ORDER OFFICE,
Ottawa, ———, 18—.

SIR: The total number of international money-orders which were issued in the Dominion of Canada from ———, 18—, to ———, 18—, inclusive, and were certified and transmitted by the several exchange offices of ———, for payment in the United States, was ———, amounting to $———.

The total number of such orders which were issued in the United States during the same period, and were certified and transmitted by said offices for payment in the Dominion of Canada, was ———, amounting to $———.

On account of which the Canadian office has already paid the following sums, viz:

———, 18— ..... $———
———, 18— ..... $———
———, 18— ..... $———
Difference remaining ..... $———

In accordance with Article VII of the convention of ———, 1875, a bill of exchange on New York, N. Y., for $——— is herewith transmitted, the receipt of which you will be pleased to acknowledge in due form.

To the POSTMASTER-GENERAL OF THE UNITED STATES,
Washington.

C.

No. —. POST-OFFICE DEPARTMENT,
MONEY-ORDER OFFICE,
Washington, D. C., ———, 18—.

SIR: The total number of international money-orders which were issued in the United States from ———, 18—, to ———, 18—, inclusive, and were certified and transmitted by the several exchange offices of ———, for payment in the Dominion of Canada, was ———, amounting to $———.

The total number of such orders which were issued in the Dominion of Canada during the same period, and were certified and transmitted by said offices for payment in the United States, was ———, amounting to $———.

On account of which the United States office has already paid the following sums, viz:

———, 18— ..... $———
———, 18— ..... $———
———, 18— ..... $———
Difference remaining ..... $———

In accordance with Article VII of the convention of ———, 1875, a bill of exchange on Montreal, Canada, is herewith transmitted, the receipt of which you will be pleased to acknowledge in due form.

———— ————,
Superintendent.

To the POSTMASTER-GENERAL OF THE
DOMINION OF CANADA, *Ottawa.*

REPORT OF THE AUDITOR OF THE TREASURY FOR THE POST-OFFICE DEPARTMENT.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
October 22, 1875.

SIR: I have the honor to submit the following annual report of the receipts and expenditures of the Post-Office Department, together with the operations of this Office in connection therewith, for the fiscal year ending June 30, 1875:

Collection of post-office revenues.

The number of post-offices in operation during the year was 35,765, which are classified under the regulations adopted for the government of the Department, chapter 25, sections 352 to 368 inclusive, as follows:

The following named offices are denominated depositories, and are required by the Postmaster-General to receive and retain, subject to the drafts of the Department, the funds of certain adjacent offices, as well as the revenues of their own:

List of offices designated as depositories, with names of postmasters.

Albany, N. Y., J. F. Smyth.
Atlanta, Ga., B. Conley.
Bangor, Me., A. B. Farnham.
Batavia, N. Y., Wm. Tyrrell.
Binghamton, N. Y., E. B. Stephens.
Buffalo, N. Y., N. B. Sherwin.
Cleveland, Ohio, John W. Allen.
Columbus, Ohio, Jas. M. Comley.
Concord, N. H., M. T. Willard.
Davenport, Iowa, Edward Russell.
Des Moines, Iowa, J. S. Clarkson.
Detroit, Mich., J. H. Kaple.
Dover, Del., F. A. Smith.
Dubuque, Iowa, G. L. Torbert.
Easton, Pa., J. K. Dawes.
Evansville, Ind., T. R. McFerson.
Fort Wayne, Ind., J. J. Kamm.
Geneva, N. Y., Chas. L. Hemiup.
Grand Rapids, Mich., A. B. Turner.
Harrisburgh, Pa., M. W. McAlarny.
Hartford, Conn., John H. Burnham.
Huntsville, Ala., J. D. Sibley.
Indianapolis, Ind., W. R. Holloway.
Kalamazoo, Mich., L. B. Kendell.
Keene, N. H., L. M. Henderson.
Knoxville, Tenn., Wm. Rule.
Lafayette, Ind., J. L. Miller.
Lancaster, N. H., John W. Spalding.
Leavenworth, Kans., D. R. Anthony.
Lexington, Ky., S. W. Price.
Lima, Ohio, C. Parmenter.
Louisville, Ky., L. M. Porter.
Lowell, Mass., E. T. Rowell.
Madison, Wis., E. W. Keyes.
Meadville, Pa., L. D. Williams.
Memphis, Tenn., J. Deloach.
Milwaukee, Wis., S. C. West.
Mobile, Ala., M. D. Wickersham.
Montpelier, Vt., J. W. Clark.
Nashville, Tenn., H. W. Hasslock.
Newark, N. J., Wm. Ward.
New Haven, Conn., N. D. Sperry.
Ogdensburgh, N. Y., R. G. Pettibone.
Olean, N. Y., J. G. Johnson.
Peoria, Ill., D. W. Magee.
Pittsburgh, Pa., E. C. Negley.
Plattsburgh, N. Y., H. S. Ransom.
Portland, Me., C. W. Goddard.
Portsmouth, Ohio, L. Adair.
Providence, R. I., C. R. Brayton.
Quincy, Ill., M. Piggott.
Raleigh, N. C., W. W. Holden.
Richmond, Va., E. L. Van Lew.
Ripon, Wis., H. S. Town.
Rochester, N. Y., D. T. Hunt.
Rutland, Vt., A. H. Tuttle.
Sandusky, Ohio, A. C. Van Tine.
Scranton, Pa., J. A. Scranton.
Springfield, Ill., J. L. Crane.
Springfield, Mass., H. C. Lee.
Steubenville, Ohio, J. M. Reede.
Saint Paul, Minn., David Day.

List of offices designated as depositories, &c.—Continued.

Savannah, Ga., J. G. Clark.
Syracuse, N. Y., D. H. Bruce.
Urbanna, Ohio, D. C. Hitt.
Utica, N. Y., C. H. Hopkins.
Vincennes, Ind., W. N. Denney.
Wheeling, W. Va., C. J. Rawlings.
Williamsport, Pa., Robert Hawley.
Wooster, Ohio, A. S. McClure.
Worcester, Mass., Josiah Pickett.
Zanesville, Ohio, J. J. Douglas.

The following depositaries and assistant treasurers receive and retain, subject to the warrants of the Post-Office Department, the funds of such post-offices as are instructed to deposit in their hands:

Designated Depositaries.

S. J. Holley, Buffalo, N. Y.
E. W. Little, Santa Fé, N. Mex.
J. P. Luce, Louisville, Ky.
J. Cushman, Olympia, Wash.
Thos. Steel, Pittsburgh, Pa.
C. H. Lorde, Tucson, Ariz.

Assistant Treasurers.

Thomas Hillhouse, New York, N. Y.
George Eyster, Philadelphia, Pa.
Peter Negley, Baltimore, Md.
F. Haven, jr., Boston, Mass.
B. F. Flanders, New Orleans, La.
C. H. Baldwin, Charleston, S. C.
W. E. Davis, Cincinnati, Ohio.
J. D. Webster, Chicago, Ill.
A. G. Edwards, Saint Louis, Mo.
Wm. Sherman, San Francisco, Cal.

One hundred and twenty-eight post-offices are draft-offices, and during the year paid 18,256 drafts issued by the Postmaster-General, countersigned, entered, and sent out by the Auditor, for sums in the aggregate of	$2,041,940 82
Twenty-seven hundred and forty-eight are deposit-offices, a portion of which during the year deposited with the Treasurer and assistant treasurers of the United States the sum of	5,384,010 64
The remaining deposit-offices deposited with the depositaries named above the sum of $579,560.70, which is embraced in the $2,041,940.82, paid on the drafts of the Department by said depositaries and draft-offices	
Twenty-nine thousand one hundred and thirty-nine offices are collection-offices, and paid on collection orders issued to mail-contractors the sum of	4,397,144 84
Three thousand seven hundred and fifty offices are special and mail-messenger offices, and derive their mail supplies by the payment of the revenue of their offices therefor, amounting to	672,483 71
The amount paid into the Treasury by postmasters, for the use and purposes of the Post-Office Department, during the fiscal year was	12,495,580 01

Revenue account of the Post-Office Department.

The receipts of the Department for the fiscal year ended June 30, 1875, were		$26,791,360 59
The amount placed in the Treasury for the service of the Department for the fiscal year, being grants in aid of the revenue under the following acts of Congress, were:		
Under the second section of the act approved June 23, 1874, for mail-steamship service between San Francisco, Japan, and China	$500,000 00	
Under the second section of the act approved June 23, 1874, for mail-steamship service between the United States and Brazil	150,000 00	
Under the second section of the act approved June 23, 1874, for law-books for the use of the Post-Office Department	2,000 00	
Under the second section of the act approved March 3, 1875, to enable the Postmaster-General to adjust the pay of railroad companies according to the act of March 3, 1873	1,000,000 00	

Revenue account of the Post-Office Department—Continued.

Under the act approved January 22, 1875, (private,) to pay D. B Allen & Co. for carrying the mails between New York and San Francisco, in 1864 and 1865	$21,543 00	
Under the act approved March 3, 1875, (private,) to pay the Allegheny Valley Railroad Company for carrying the mails in 1868 and 1869	7,232 75	
Under the act approved March 3, 1875, (private,) to pay the Terre Haute and Indianapolis Railroad Company, successors of the Terre Haute and Richmond Railroad Company, being the amount found due said company by the Court of Claims	7,543 75	
Under the third section of the act approved March 3, 1875, to enable the Postmaster-General to re-adjust salaries of certain fourth-class officers in accordance with section 84 of act of June 8, 1872	300,000 00	
Under the first section of the act approved March 3, 1870, for supplying deficiency in the revenue of the Post-Office Department for the fiscal year ended June 30, 1871	14,853 62	
Under the third section of the act approved March 3, 1871, for supplying deficiency in the revenue of the Post-Office Department for the fiscal year ended June 30, 1872	22,106 02	
Under the fourth section of the act approved June 1, 1872, for supplying deficiency in the revenue of the Post-Office Department for the fiscal year ended June 30, 1873	85,942 33	
Under the third section of the act approved March 3, 1873, for supplying deficiency in the revenue of the Post-Office Department for the fiscal year ended June 30, 1874	193,425 49	
Under the third section of the act approved June 23, 1874, for supplying deficiency in the revenue of the Post-Office Department for the fiscal year ended June 30, 1875	4,400,000 00	
		$6,704,646 96
Aggregate of revenue and grants		33,496,007 55
The expenditures of the Department for the fiscal year ended June 30, 1875, were		33,611,309 45
Excess of expenditures		115,301 90

The net revenue of the Department from postages, being the aggregate of balances due the United States by postmasters on the adjustment of their quarterly-accounts for the year, after deducting their compensation and the expenses of their offices, was:

For the quarter ended September 30, 1874	$3,499,095 24
For the quarter ended December 31, 1874	3,599,830 94
For the quarter ended March 31, 1875	3,895,637 91
For the quarter ended June 30, 1875	3,606,708 49
Total	14,601,272 58

The amount of book, newspaper, and pamphlet postage, paid in money, was:

For the quarter ended September 30, 1874	$293,472 61
For the quarter ended December 31, 1874	284,296 07
For the quarter ended March 31, 1875	1,504 85
For the quarter ended June 30, 1875	91 42
Total	579,364 95

Revenue account of the Post-Office Department—Continued.

The amount of letter-postage paid in money, was:

For the quarter ended September 30, 1874	$71 199 75
For the quarter ended December 31, 1874	64,521 38
For the quarter ended March 31, 1875	82,865 71
For the quarter ended June 30, 1875	68,382 20
Total	286,969 04

The amount of stamps, stamped envelopes, postal cards, and newspaper-wrappers sold, was:

For the quarter ended September 30, 1874	$5,431,944 82
For the quarter ended December 31, 1874	6,173,164 97
For the quarter ended March 31, 1875	6,381,028 42
For the quarter ended June 30, 1875	6,504,804 02
Total	24,490,942 23

The amount of official stamps furnished the different Departments, and included in the above amount of stamps sold, was:

To the Department of State	$12,520 00
To the Navy Department	16,620 00
To the War Department	73,265 43
To the Agricultural Department	40,390 00
To the Interior Department	84,870 00
To the Department of Justice	5,124 00
To the Treasury Department	190,750 00
To the Post-Office Department	587,506 00
Total	1,011,045 43

The number of quarterly-returns of postmasters received and audited, on which the sum of $14,601,272.58 was found due the United States, was:

For the quarter ended September 30, 1874	33,011
For the quarter ended December 31, 1874	34,242
For the quarter ended March 31, 1875	34,557
For the quarter ended June 30, 1875	34,873
Total	136,683

MAIL-TRANSPORTATION.

The amount charged to transportation accrued and placed to the credit of mail-contractors and others, for mail-transportation during the year, was:

For the regular service of mail-routes	$15,145,497 96
For the supply of special and mail-messenger offices	667,745 09
For the salaries of postal-railway clerks, route and other agents	2,279,970 73
For the salaries and per diem of the assistant superintendents of the postal-railway service	53,768 82
	18,146,982 60

FOREIGN-MAIL TRANSPORTATION.

San Francisco, Japan, and China	$500,000 00
San Francisco, Japan, and China, (extra service)	8,099 84
United States and Brazil	150,000 00
New York and Rio Janeiro	347 20
New York, Great Britain, and Ireland	131,334 54
Boston and Great Britain	3,849 58
Chicago, Detroit, Portland, and Great Britain	4,876 67
Philadelphia and Queenstown	1,669 82
New York, England, France, and Germany	46,397 70
New York, England, and Bremen	33,406 50
Boston, Prince Edward Island, and Nova Scotia	568 06

Mail-Transportation—Continued.

Baltimore and Bremen	$28 00	
Baltimore, Havana, and New Orleans	594 30	
New Orleans, Key West, and Havana	2,654 96	
New York and Rotterdam	3 73	
New York and West Indies	9,688 21	
New York, Venezuela, and United States of Colombia	1,412 60	
New York, Havana, New Orleans, and Vera Cruz	52,172 21	
New York, and San Francisco, and Ecuador, via Panama	49,303 59	
New Orleans, Havana, and France	221 13	
Cleveland and Canada	194 25	
New York, Philadelphia, and Belgium	42 51	
Portland and Nova Scotia	1,408 30	
Philadelphia, Havana, and New Orleans	2,750 16	
Expenses of Government mail-agent at Havana	800 00	
Expenses of Government mail-agent at Panama	1,473 55	
Expenses of Government mail-agent at Aspinwall	940 00	
Expenses of Government mail-agent at Hakodadi, Japan	374 52	
		$1,009,611 93
		19,156,594 53

The amount credited to transportation accrued and charged to contractors, was:

For fines imposed	$3,495 06	
For deductions	149,466 36	
		152,961,42
Net amount to the credit of mail-contractors and others		19,003,633 11
The amount actually paid during the year was		$18,777,201 20

Statement of collecting-division.

This division has had charge of 24,400 accounts of postmasters who became late during the period from July 1, 1873, to June 30, 1875.

Amounts collected from postmasters becoming late prior to July 1, 1874:

Collected by draft		$142,139 19
Collected by suit		16,801 37
Credited on vouchers		107,944 10
Charged to suspense		41 63
Charged to bad debts		1,434 72
Charged to compromise debts		2,669 11
Total		271,030 12
Amount collected by draft from contractors		$9,424 00
Number of changes of postmasters reported by appointment-office during the fiscal year, was 15,262; and the balances due the United States upon the accounts of said late postmasters, amount to		$304,891 84
Of which there has been—		
Collected by draft	$95,176 22	
Credited on vouchers	142 54	
Charged to suspense	243 68	
Charged to bad debts	76 20	
		95,638 64
Total remaining due		209,253 20
Of which there is—		
In suit	$1,069 52	
Not in suit	208,183 68	
		209,253 20

Amount reported due late postmasters, late prior to July 1, 1874:

As per last report	$64,785 35
Increase during the fiscal year	15,794 03
Total	80,579 38

Statement of collecting-division—Continued.

Amount paid thereon	$48,880 31	
Amount closed by suspense	9,452 23	
Amount remaining due	22,246 84	
		$80,579 38
Amount due postmasters late during the fiscal year		127,866 53
Amount paid thereon	$64,491 70	
Amount closed by suspense	295 82	
Amount remaining due	63,079 01	
		127,866 53
Accounts of late postmasters for which suit has been brought during the fiscal year		49,814 17
Amount collected by suit during the fiscal year		29,822 79

The subjoined tables, numbered from 1 to 51 inclusive, exhibit in detail the transactions of the Department for the fiscal year.

I have the honor to be, very respectfully,

J. M. McGREW,
Auditor.

HON. MARSHALL JEWELL,
Postmaster-General.

No. 1.—*Statement exhibiting quarterly the receipts of the Post-Office Department, under their several heads, during the fiscal year ended June* 30, 1875.

Receipts.	Quarter ended September 30, 1874.	Quarter ended December 31, 1874.	Quarter ended March 31, 1875.	Quarter ended June 30, 1875.	Aggregate.
Letter-postage	$71,199 75	$64,521 38	$82,865 71	$68,382 20	$286,969 04
Book, newspaper, and pamphlet postage	293,472 61	284,296 07	1,504 85	91 42	579,364 95
Box-rents and branch offices	316,173 81	313,530 23	320,201 35	320,648 84	1,270,554 23
Fines and penalties	439 54	1,457 25	9,190 38	3,199 12	14,286 29
Postage-stamps, stamped envelopes, and postal cards	5,431,944 82	6,173,164 97	6,361,028 42	6,504,804 02	24,490,942 23
Dead-letters	1,430 00	900 00	6,850 00	.....	9,180 00
Revenue from money-order business	.....	.....	.....	120,142 09	120,142 09
Miscellaneous	3,386 02	3,248 23	3,980 60	9,306 91	19,921 76
Total	6,118,046 55	6,841,118 13	6,805,621 31	7,026,574 60	26,791,360 59

J. M. McGREW, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 22, 1875.

No. 2.—*Statement exhibiting quarterly the expenditures of the Post-Office Department, under their several heads, for the fiscal year ended June 30, 1875.*

Expenditures.	Quarter ended September 30, 1874.	Quarter ended December 31, 1874.	Quarter ended March 31, 1875.	Quarter ended June 30, 1875.	Aggregate.
Compensation to postmasters	$1,692,439 33	$1,806,752 89	$1,786,944 54	$1,763,799 01	$7,049,935 77
Additional compensation to postmasters for fiscal year ended June 30, 1874, act March 3, 1875	.....	.....	295,688 44	2,498 89	298,187 33
Ship, steamboat, and way letters	1,175 18	908 15	668 15	1,001 70	3,753 18
Transportation of the mails	4,417,807 21	4,949,643 71	4,743,587 26	4,666,163 02	18,777,201 20
Wrapping-paper	1,460 00	1,908 22	5,238 88	2,960 00	11,567 10
Office-furniture	2,041 81	4,345 88	4,464 24	6,012 38	16,864 31
Advertising	62,122 83	88,486 16	13,008 44	4,763 77	168,381 20
Mail-bags and catchers	60,451 06	57,931 18	45,317 84	23,448 00	187,148 08
Mail locks and keys	10,282 03	9,247 65	2,759 40	9,522 34	31,811 42
Mail depredations and special agents	39,282 00	35,673 78	38,138 91	37,599 08	150,693 77
Compensation of clerks for offices	839,077 37	843,827 38	842,513 27	889,393 24	3,414,811 26
Postage-stamps, stamped envelopes, and postal cards	154,725 00	234,480 33	161,240 25	173,741 26	724,186 84
Compensation of letter-carriers	455,210 61	469,787 74	473,928 87	480,282 89	1,879,210 11
Dead-letters	1,760 00	.....	.....	552 42	2,312 42
Postmarking and canceling stamps	1,044 86	1,051 31	2,315 98	1,531 08	5,943 23
Twine	9,964 50	12,043 07	12,354 50	9,449 50	43,811 57
Letter-balances	1,244 00	16,303 15	215 65	1,686 44	19,449 24
Rent, light, and fuel	84,487 54	103,339 64	93,285 17	108,526 30	389,638 85
Balances due foreign countries	58,003 48	20,271 30	36,498 29	66,959 45	181,732 52
Miscellaneous	55,245 90	84,682 84	44,360 55	30,953 15	215,242 44
Miscellaneous stationery	7,855 33	7,226 03	10,722 08	13,624 17	39,427 61
Total	7,955,680 04	8,747,910 41	8,613,250 71	8,294,468 29	33,611,309 45

J. M. McGREW, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 22, 1875.

No. 3.—*Statement of the postal receipts and expenditures of*

States and Territories.	Letter-postage.	Book, newspaper, and pamphlet postage.	Waste-paper and twine.	Box-rents and branch offices.	Postage-stamps, stamped envelopes, and postal cards.	Total receipts.
Maine	$3,560 86	$12,425 19	$137 00	$23,149 42	$384,636 19	$423,908 66
New Hampshire	1,042 54	8,799 84	173 78	13,433 31	244,872 18	268,321 65
Vermont	819 66	7,934 39	94 65	9,869 13	228,405 18	247,123 01
Massachusetts	15,691 00	31,742 28	507 36	104,746 61	1,781,269 33	1,933,956 58
Rhode Island	1,737 33	3,604 48	141 93	20,028 51	190,285 52	215,797 77
Connecticut	3,460 20	12,887 36	265 85	36,441 80	530,188 50	583,243 71
New York	105,037 74	81,543 23	2,368 30	185,019 87	4,946,339 72	5,320,308 86
New Jersey	4,965 54	12,777 53	186 35	25,056 44	518,251 59	561,237 45
Pennsylvania	22,602 40	47,085 85	1,294 01	85,538 54	2,356,114 74	2,512,635 54
Delaware	402 65	1,703 25	16 71	1,352 76	62,296 65	65,772 02
Maryland	9,607 25	9,083 82	111 48	10,044 81	462,736 91	491,584 27
Virginia	2,059 98	10,806 38	89 60	11,734 41	371,859 77	396,550 14
West Virginia	739 61	4,487 99	55 45	3,466 20	125,289 59	134,038 84
North Carolina	703 83	6,630 10	71 13	7,658 44	173,983 40	189,046 90
South Carolina	896 34	4,922 79	41 36	7,162 90	148,709 70	161,733 09
Georgia	1,649 15	9,158 76	185 37	18,973 84	287,669 46	317,636 58
Florida	1,970 80	1,264 40	27 14	4,596 07	57,842 62	65,701 03
Ohio	8,821 78	42,861 78	1,151 55	78,140 38	1,609,292 32	1,740,267 81
Michigan	21,727 19	26,613 96	767 74	60,702 34	758,836 82	868,648 05
Indiana	2,859 04	24,719 94	482 95	43,103 73	676,927 16	748,092 82
Illinois	16,487 01	43,753 04	2,155 96	97,253 56	1,932,279 11	2,091,928 68
Wisconsin	5,769 06	20,284 50	374 92	41,542 90	548,575 12	616,546 50
Iowa	4,267 66	24,162 49	380 10	52,035 21	674,722 22	755,567 68
Missouri	6,282 03	23,656 57	711 99	30,666 94	860,899 31	922,216 84
Kentucky	1,823 17	10,363 75	232 31	15,314 36	377,183 40	404,916 99
Tennessee	1,456 00	9,021 37	253 04	10,367 97	277,007 09	298,105 47
Alabama	1,168 57	5,500 58	49 48	13,690 76	171,241 89	191,651 28
Mississippi	821 21	5,392 34	52 29	13,904 45	147,095 79	167,266 08
Arkansas	423 42	3,141 51	60 04	7,742 44	97,282 67	108,650 08
Louisiana	6,446 26	5,819 67	104 04	22,064 85	234,789 96	269,224 78
Texas	3,501 38	10,462 55	209 83	34,969 74	340,388 37	389,531 87
California	12,363 82	15,746 11	269 07	53,915 01	664,259 13	746,553 14
Oregon	149 73	2,899 19	47 32	8,538 80	64,787 13	76,422 17
Minnesota	5,481 67	10,737 81	251 92	22,116 74	287,302 96	325,891 10
Kansas	1,317 20	9,232 73	170 75	24,742 37	274,553 97	310,017 02
Nebraska	927 18	5,001 79	406 55	10,224 03	144,545 19	161,104 74
Nevada	581 50	2,231 01	57 83	13,238 25	57,318 75	73,427 34
Colorado	528 81	2,889 72	81 75	19,196 74	97,815 77	120,512 79
Utah	380 41	1,895 70	24 18	5,534 90	51,940 16	59,775 35
New Mexico	62 62	299 55	6 02	1,304 86	16,187 53	17,860 58
Washington	94 93	1,012 11	13 30	1,898 34	17,866 02	20,884 70
Dakota	248 74	710 99	16 27	1,393 83	23,087 10	25,456 93
Arizona	34 21	296 13	4 85	720 70	8,784 27	9,840 16
Idaho	81 99	578 28	18 25	2,160 40	12,623 76	15,462 68
Wyoming	90 65	628 97	14 80	2,391 70	24,352 73	27,478 85
Montana	99 35	973 76	16 52	4,885 75	21,585 07	27,560 45
Alaska	2 69	3 10	.....	18 00	149 19	172 98
District of Columbia	3,421 82	2,500 12	166 08	7,468 24	166,456 47	180,012 73
	284,667 98	580,248 76	14,319 17	1,269,521 35	23,510,887 48	25,659,644 74
Deduct miscellaneous items	.....	883 81	.....	.....	.....	.....
Add miscellaneous items	2,301 06	.....	.....	1,032 88	980,054 75	982,504 88
	286,969 04	579,364 95	14,319 17	1,270,554 23	24,490,942 23	26,642,149 62

NOTE.—The following items of expenditure and revenue, being of a general nature, are not embraced

Amount paid for foreign mails and expenses of Government agent	$1,009,611 93
Balances due foreign countries	181,732 52
Ship, steamboat, and way letters	3,753 18
Wrapping-paper	11,567 10
Twine	43,811 57
Office-furniture	643 25
Advertising	153,395 75
Mail-bags and catchers	102,724 56
Salaries and per diem of assistant superintendents of postal-railway service	53,768 82
Mail locks and keys	31,811 42
Postmarking and canceling stamps	5,943 23
Mail depredations and special agents	150,693 77
Letter-balances	19,449 24
Expenses of postage-stamps, stamped envelopes, and postal cards	724,186 84
Dead-letters	2,312 42
Miscellaneous payments	120,138 56
Additional compensation to postmasters for year ended June 30, 1874. Act of Mar. 3, 1875	298,187 33
Excess of expenditures brought down	4,281,860 35
	7,195,591 74

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, October 22, 1875.

the United States for the fiscal year ended June 30, 1875.

Compensation of postmasters.	Clerks for offices, rent, light, and fuel, and incidental expenses of post-offices.	Compensation of letter-carriers.	Compensation of route-agents, postal-railway clerks, mail-messengers, and supply of special offices.	Transportation by States.	Total expenses.	Excess of expenditures over receipts.	Excess of receipts over expenditures.
$170, 180 33	$48, 104 06	$12, 094 04	$43, 163 03	$282, 876 03	$556, 417 49	$132, 508 83	.....
118, 749 39	17, 433 72	6, 294 71	21, 976 70	128, 845 23	293, 299 75	24, 978 10	.....
119, 025 40	15, 861 22	.....	21, 614 48	185, 831 19	342, 332 29	95, 209 28	.....
372, 543 34	323, 817 93	161, 717 71	172, 141 44	364, 207 72	1, 394, 428 14	.....	$539, 528 44
43, 221 65	24, 101 76	14, 401 57	7, 184 75	52, 684 17	141, 593 90	.....	74, 203 87
180, 123 39	68, 214 71	20, 065 00	51, 385 60	236, 272 67	556, 061 37	.....	27, 182 34
761, 708 75	1, 115, 808 73	558, 117 04	389, 585 90	1, 663, 066 08	4, 488, 286 50	.....	832, 022 36
190, 263 49	42, 402 87	51, 454 37	29, 090 84	181, 626 18	494, 837 75	.....	66, 399 70
594, 721 57	342, 092 56	28), 512 39	186, 557 90	730, 223 30	2, 134, 107 72	.....	378, 527 82
21, 770 85	6, 038 40	8, 393 33	8, 551 18	31, 476 82	76, 230 58	10, 458 56	.....
87, 132 38	83, 907 86	58, 910 08	43, 487 84	314, 932 69	588, 370 85	96, 786 58	.....
146, 900 30	49, 958 29	19, 467 71	42, 629 16	393, 613 88	652, 569 34	256, 019 20	.....
60, 228 14	14, 703 47	3, 388 55	18, 209 71	130, 597 63	227, 127 50	93, 088 66	.....
88, 397 67	17, 384 64	.....	39, 193 39	201, 142 64	346, 118 34	157, 071 44	.....
57, 161 26	12, 469 94	5, 590 60	17, 208 06	180, 925 00	273, 354 86	111, 621 77	.....
109, 217 91	45, 551 15	7, 802 03	51, 845 41	238, 696 34	453, 112 84	135, 476 26	.....
30, 012 21	5, 968 92	.....	11, 626 18	217, 562 00	265, 169 31	199, 468 28	.....
483, 231 72	200, 362 21	118, 320 52	240, 455 78	1, 074, 927 84	2, 117, 298 07	377, 030 26	.....
353, 147 80	94, 292 06	32, 826 43	72, 129 00	436, 588 23	988, 983 52	120, 335 47	.....
287, 264 73	112, 557 26	32, 108 48	97, 367 90	481, 848 00	1, 011, 146 37	263, 053 55	.....
554, 046 64	457, 221 15	152, 351 66	381, 364 85	1, 100, 487 20	2, 645, 471 50	553, 542 82	.....
238, 952 09	62, 898 24	23, 119 66	78, 634 72	364, 138 62	767, 743 33	151, 196 83	.....
330, 776 86	62, 627 59	15, 936 75	132, 369 55	457, 510 67	999, 221 42	243, 653 74	.....
233, 698 50	158, 530 99	106, 676 00	135, 597 97	811, 955 93	1, 446, 459 39	524, 242 55	.....
129, 403 02	49, 913 26	30, 514 36	49, 820 66	269, 745 51	529, 396 81	124, 479 82	.....
100, 885 35	49, 182 40	19, 160 99	87, 597 41	265, 095 13	521, 921 28	223, 815 81	.....
81, 299 93	26, 208 54	3, 857 07	34, 531 88	302, 157 30	448, 054 72	256, 403 44	.....
88, 978 76	12, 821 34	.....	14, 726 06	151, 255 08	267, 781 24	100, 515 16	.....
55, 852 60	13, 003 83	.....	14, 307 60	351, 251 22	434, 415 25	325, 765 17	.....
43, 125 43	67, 265 80	39, 545 88	18, 536 54	269, 135 75	437, 609 40	168, 384 62	.....
157, 869 71	48, 994 46	.....	36, 210 62	774, 489 83	1, 017, 564 62	628, 032 75	.....
153, 978 38	106, 729 72	37, 920 46	62, 672 64	433, 295 52	794, 596 72	48, 043 58	.....
33, 567 92	10, 600 08	.....	7, 529 00	121, 682 54	173, 379 54	96, 957 37	.....
131, 273 50	35, 495 33	12, 054 44	58, 582 51	226, 768 63	464, 174 41	138, 283 31	.....
158, 953 27	33, 392 27	3, 045 38	72, 289 55	250, 269 56	517, 950 03	207, 933 01	.....
71, 982 76	18, 715 60	4, 217 25	68, 581 87	431, 591 16	595, 088 64	433, 983 90	.....
35, 209 46	11, 790 44	.....	2, 326 84	128, 385 79	177, 712 53	104, 285 19	.....
46, 715 42	22, 258 43	.....	12, 317 13	136, 501 42	217, 792 40	97, 279 61	.....
27, 246 11	9, 827 69	.....	4, 982 85	258, 725 61	300, 782 26	241, 006 91	.....
11, 368 25	1, 306 45	.....	.....	137, 386, 48	150, 061 18	132, 200 60	.....
12, 510 96	947 50	.....	1, 031 73	115, 973 06	130, 463 25	109, 578 55	.....
14, 634 81	1, 248 10	.....	413 83	54, 140 58	70, 437 32	44, 980 39	.....
5, 646 09	200 00	.....	1 66	69, 347 81	75, 195 56	65, 355 40	.....
9, 593 36	1, 120 00	.....	50 00	69, 475 78	80, 239 14	64, 776 46	.....
11, 746 28	3, 665 00	.....	188 00	20, 600 00	36, 199 28	8, 720 43	.....
16, 644 78	5, 580 55	.....	155 33	67, 764 59	90, 145 25	62, 584 80	.....
108 57	.....	.....	.....	.....	108 57	.....	64 41
7, 201 43	117, 924 13	34, 555 05	107, 490 77	.....	267, 171 38	87, 152 65	.....
7, 038, 272 52	4, 030, 500 65	1, 874, 419 51	2, 947, 715 82	15, 167, 074 41	31, 057, 982 91	7, 316, 267 11	1, 917, 928 94
.....	.....	.....	.....	174, 537 87	133, 973 04	133, 973 04	.....
11, 663 25	24, 110 98	4, 790 60	.....	.....	.....	.....	982, 504 88
7, 049, 935 77	4, 054, 611 63	1, 879, 210 11	2, 947, 715 82	14, 992, 536 54	30, 924, 009 87	7, 182, 294 07	2, 900, 433 82

in the above statement, viz:

Receipts on account of dead-letters	$9, 180 00
Receipts on account of fines and penalties	14, 286 29
Receipts on account of miscellaneous	5, 602 59
Receipts on account of money-order business	120, 142 09
Excess of transportation accrued	226, 431 91
Total excess of expenditures over receipts	6, 819, 948 86
	7, 195, 591 74

J. M. McGREW, *Auditor.*

No. 4.—*Table exhibiting the receipts and expenditures of the Post-Office Department from July 1, 1836, to June 30, 1875.*

Year	Receipts.			Expenditures.
	Revenue.	Treasury grants.	Total.	
1837	$4,945,668 21	.....	$4,945,668 21	$3,288,319 03
1838	4,238,733 46	.....	4,238,733 46	4,430,662 21
1839	4,484,656 70	.....	4,484,656 70	4,636,536 31
1840	4,543,521 92	.....	4,543,521 92	4,718,235 64
1841	4,407,726 27	$482,657 00	4,890,383 27	4,499,527 61
1842	4,546,849 65	.....	4,546,849 65	5,674,751 80
1843	4,296,225 43	.....	4,296,225 43	4,374,753 71
1844	4,237,287 83	.....	4,237,287 83	4,296,512 70
1845	4,289,841 80	.....	4,289,841 80	4,320,731 99
1846	3,487,199 35	750,000 00	4,237,199 35	4,076,036 91
1847	3,880,309 23	12,500 00	3,892,809 23	3,979,542 10
1848	4,555,211 10	125,000 00	4,680,211 10	4,326,850 27
1849	4,705,176 28	.....	4,705,176 28	4,479,049 13
1850	5,499,984 86	.....	5,499,984 86	5,212,953 43
1851	6,410,604 33	.....	6,410,604 33	6,278,401 62
1852	5,184,526 84	1,741,444 44	6,925,971 28	7,108,459 04
1853	5,240,724 70	2,255,000 00	7,495,724 70	7,982,756 59
1854	6,255,586 22	2,736,748 96	8,992,335 18	8,577,424 12
1855	6,642,136 13	3,114,542 26	9,756,678 39	9,968,342 29
1856	6,920,821 66	3,748,881 56	10,669,703 22	10,405,286 36
1857	7,353,951 76	4,528,004 67	11,881,956 43	11,508,057 93
1858	7,486,792 86	4,679,270 71	12,166,063 57	12,722,470 01
1859	7,968,484 07	3,915,946 49	11,884,430 56	11,458,083 63
1860	8,518,067 40	11,154,167 54	19,672,234 94	19,170,609 99
1861	8,349,296 40	4,639,806 53	12,989,102 93	13,606,759 11
1862	8,299,820 90	2,598,953 71	10,898,774 61	11,125,364 13
1863	11,163,789 59	1,007,848 72	12,171,638 31	11,314,206 84
1864	12,438,253 78	749,980 00	13,188,233 78	12,644,786 20
1865	14,556,158 70	3,968 46	14,560,127 16	13,694,728 28
1866	14,386,986 21	.....	14,386,986 21	15,352,079 30
1867	15,227,026 87	3,991,666 67	19,228,693 54	19,235,483 46
1868	16,292,600 80	5,696,525 00	21,989,125 80	22,730,592 65
1869	18,344,510 72	5,707,115 30	24,051,626 02	23,698,131 50
1870	19,772,220 65	4,022,140 85	23,794,361 50	23,998,837 63
1871	20,037,045 42	4,126,200 00	24,163,245 42	24,390,104 08
1872	21,915,426 37	4,993,750 00	26,909,176 37	26,658,192 31
1873	22,996,741 57	5,990,475 00	28,987,216 57	29,084,945 67
1874	26,471,071 82	5,922,433 55	32,393,505 37	32,126,414 58
1875	26,791,360 59	6,704,646 96	33,496,007 55	33,611,309 45
Total	387,152,398 45	95,399,674 38	482,552,072 83	480,766,289 67

J. M. McGREW, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 22, 1875.

No. 5.—*Statement in detail of miscellaneous payments made by the Post-Office Department for the fiscal year ended June 30, 1875, exhibiting the sums placed to the credit of postmasters and others, and charged to miscellaneous account.*

Date.	To whom allowed.	For what object.	Amount.
1874. Dec. 5	J. S. Slocum	Late postmaster, Scranton, Pa., for miscellaneous items in the 3d and 4th quarters, 1873.	$7 50
17	E. M. Smith	Postmaster, Rochester, N. Y., for printing in the 3d quarter, 1874.	92 00
1875. Feb. 23	A. B. Farnham	Postmaster, Bangor, Me., for miscellaneous items in the 4th quarter, 1874.	18 85
Mar. 12	T. B. Van Buren	United States consul, &c., Kanagawa, Japan, for miscellaneous items during the period from August 6 to December 31, 1874.	259 42
12	W. P. Mangum	United States consul, &c., Nagasaki, Japan, for printing in the 1st quarter, 1873; for miscellaneous items during the 4th quarter, 1873, and the 4th quarter, 1874, and for rent of fire-proof safe from February 1, 1874, to December 31, 1874.	164 65
25	J. W. Howson	Postmaster, Cazenovia, N. Y., for amount paid for telegraphing Postmaster-General and Third Assistant Postmaster-General in the 4th quarter, 1874.	2 06

No. 5.—*Amounts paid by the Department on warrants, &c.*—Continued.

Date.	To whom allowed.	For what object.	Amount.
1875. Mar. 25	George F. Seward	United States consul-general, Shanghai, China, for miscellaneous expenses during the 2d and 3d quarters, 1874.	$75 98
Apr. 14	Julia P. Woolfolk	Postmaster, Jackson, Tenn., for amount paid for furnishing a room for post-office in the 4th quarter, 1874.	42 75
May 10	George F. Seward	United States consul-general, &c., Shanghai, China, for miscellaneous items in the 4th quarter, 1874.	29 53
17	Thomas B. Van Buren	United States consul, &c., Kanagawa, Japan, for miscellaneous expenses in the 1st quarter, 1875.	36 34
26	Benjamin W. Davis	Postmaster, Richmond, Ind., for miscellaneous items in the 3d and 4th quarters, 1874, and 1st quarter, 1875.	26 68
June 18	J. W. Howson	Postmaster, Cazenovia, N. Y., for amount expended in telegraphing postmaster, Syracuse, and Third Assistant Postmaster-General.	1 13
July 26	N. D. Sperry	Postmaster, New Haven, Conn., for copies of journal in the 1st quarter, 1875.	8 32
28	R. S. Hendricks	Postmaster, Chattanooga, Tenn., for water in the 4th quarter, 1874, and 1st quarter, 1875.	20 25
Aug. 19	John L. Miller	Postmaster, La Fayette, Ind., for miscellaneous expenses in the 4th quarter, 1874, and 1st quarter, 1875.	49 85
19	T. H. Kaple	Postmaster, Detroit, Mich., for miscellaneous items in the 2d quarter, 1875.	68 85
Sept. 30	George F. Seward	United States consul-general and postal agent, Shanghai, China, for miscellaneous expenses incurred during the 1st and 2d quarters, 1875.	16 89
1874. Oct. 3	G. H. Reay	New York, N. Y., for official stamped envelopes furnished in September, 1874.	1,838 51
3	G. H. Reay	New York, N. Y., for post-office envelopes furnished during 3d quarter, 1874.	3,514 43
3	G. F. Nesbitt & Co	New York, N. Y., for post-office and registered-package envelopes furnished in September, 1874.	11,036 40
5	G. T. Swann	Clerk United States circuit court, Jackson, Miss., for fees in four post-office cases.	10 45
13	H. O. Houghton & Co	Cambridge, Mass., for 30,000 Official Postal Guides furnished October 10, 1874.	6,450 00
13	G. D. Chenoweth	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer, for the half month ended October 15, 1874.	790 40
15	A. Comstock	Brooklyn, N. Y., for moieties of fines imposed by the United States district courts of Northern and Southern New York upon William G. Burrows, Orson F. Cobb, John P. Russ, Charles Rosboro, John L. Lyon, Leander Fox, Byron Fox, S. H. Hundson, and J. A. Patterson, convicted of mailing obscene matter.	1,200 00
19	G. W. Wood	Quincy, Ill., for services and expenses in case of E. Quinlan *vs.* F. A. Eastman, late postmaster, Chicago, Ill., and G. A. Wood, late special agent.	75 00
20	H. W. Hilliard	Attorney at law, Washington, D. C., for services in the case of the United States *vs.* T. G. Simms, late postmaster at Atlanta, Ga.	500 00
30	G. D. Chenoweth	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer for the half month ended October 31, 1874.	1,950 45
Nov. 9	T. & J. W. Johnson & Co	Philadelphia, Pa., for law-books furnished the Post-Office Department.	1,264 25
10	G. B. McCartee	Washington, D. C., for engraving, printing, numbering, and binding 2,500 post-office drafts.	53 13
13	W. L. Nicholson	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer for the half month ended November 15, 1874.	740 00
23	J. S. Botsford	United States attorney, Jefferson City, Mo., for fees in two post-office cases.	40 00
23	George Smith	United States marshal, Jefferson City, Mo., for fee in one post-office case.	15 92
27	W. L. Nicholson	Washington, D C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer for the half month ended November 30, 1874.	1,227 83
30	D. McClelland	Washington, D. C., for engraving and printing post-route maps.	1,854 70

No. 5.—*Amounts paid by the Department on warrants, &c.*—Continued.

Date.	To whom allowed.	For what object.	Amount.
1874.			
Dec. 3	F. A. Woolfley	Clerk United States circuit court, New Orleans, La., for fees in nine post-office cases.	$85 05
9	The National Bank-Note Company.	New York, N. Y., for printing, gumming, perforating, and paper for 350,000 registered-package seals.	525 00
14	G. B. McCartee	Washington, D. C., for engraving, printing, numbering, and binding 4,000 post-office drafts and warrants.	86 00
16	William J. Points	Clerk United States circuit court, Harrisonburgh, Va., for fee in one post-office case.	42 50
16	W. L. Nicholson	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer for the half month ended December 15, 1874.	1,215 49
30	W. L. Nicholson	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer for the half month ended December 31, 1874.	929 14
1875.			
Jan. 2	V. S. Lusk	United States attorney, Asheville, N. C., for fees in two post-office cases.	40 00
2	A. E. Buck	Clerk United States circuit court, Atlanta, Ga., for fees in three post-office cases.	43 75
11	W. Van Dyke	United States attorney, San Francisco, Cal., for fees in two post-office cases.	40 00
14	W. L. Nicholson	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer, for the half month ended January 15, 1875.	735 00
15	George F. Nesbitt & Co	New York, N. Y., for 504,000 registered-package envelopes furnished in the 4th quarter, 1874.	4,430 08
15	A. N. Lewis	New York, N. Y., for license-fees on 504,000 registered-package envelopes.	252 00
16	R. G. Usher	United States marshal, Boston, Mass., for fee in one post-office case.	12 60
19	R. L. Goodrich	Clerk United States circuit court, Little Rock, Ark., for fee in one post-office case.	7 10
19	N. Trusler	United States attorney, Connersville, Ind., for fee in one post-office case.	10 00
20	W. S. Lurty	United States attorney, Harrisonburgh, Va., for fee in one post-office case.	10 00
20	E. S. Kearney	United States marshal, Olympia, Wash., for fee in one post-office case.	56 00
25	H. O. Houghton & Co	Cambridge, Mass., for 30,000 official postal guides, furnished January 22, 1875.	4,050 00
29	W. L. Nicholson	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer, for the half month ended January 31, 1875.	1,034 97
Feb. 1	G. H. Reay	New York, N. Y., for post-office envelopes furnished during 4th quarter, 1874.	4,987 80
10	G. R. Peck	United States attorney, Topeka, Kans., for fees in six post-office cases.	85 00
13	W. L. Nicholson	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer, for the half month ended February 15, 1875.	1,082 89
19	A. T. Akerman	Attorney at law, Cartersville, Ga., for balance of fee in one post-office case.	750 00
26	G. B. McCartee	Washington, D. C., for engraving and printing 100 post-office drafts.	2 12
26	G. R. Hill	Clerk United States district court, Oxford, Miss., for fees in nine post-office cases.	27 87
26	W. L. Nicholson	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer, for the half month ended February 28, 1875.	931 54
26	S. R. Smith	Clerk United States circuit court, Wilmington, Del., for fee in one post-office case.	11 10
Mar. 4	G. B. McCartee	Washington, D. C., for engraving and printing 1,000 post-office drafts and warrants.	21 50
12	J. C. Wilson	Clerk United States district court, Topeka, Kans., for fees in three post-office cases.	66 55
12	J. R. Wilkins	Clerk United States district court, Beaver City, Utah, for fee in one post-office case.	13 35

No. 5.—*Amounts paid by the Department on warrants, &c.*—Continued.

Date.	To whom allowed.	For what object.	Amount.
1875.			
Iar. 12	G. B. McCartee	Washington, D. C., for engraving, printing, numbering, and binding 10,200 post-office drafts and warrants.	$219 30
12	W. L. Nicholson	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer, for the half month ended March 15, 1875.	1,037 20
15	George Tyng	Late United States marshal, Prescott, Ariz., for fee in one post-office case.	12 00
29	D. McClelland	Washington, D. C., for engraving and printing post-route maps.	1,126 98
30	W. L. Nicholson	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer, for the half month ended March 31, 1875.	1,607 69
pr. 8	W. T. Cox	Special agent, Post-Office Department, Galveston, Tex., for amount to re-imburse him for advance to pay Ferris & Rainey, attorneys at law, for services in one post-office case.	25 00
10	George F. Nesbitt & Co	New York, N. Y., for 796,000 registered-package envelopes in the 1st quarter, 1875.	6,980 92
10	A. N. Lewis	New York, N. Y., for royalty on 796,000 registered-package envelopes.	398 00
13	G. H. Reay	New York, N. Y., for post-office envelopes furnished during 1st quarter, 1875.	5,726 87
13	C. P. Latham	Clerk United States circuit court, Danville, Va., for fee in one post-office case.	12 45
14	W. L. Nicholson	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer, for the half month ended April 15, 1875.	1,003 85
22	J. H. Pierce	United States marshal, Oxford, Miss., for fees in two post-office cases.	56 50
22	J. S. Rottsford	United States attorney, Jefferson City, Mo., for fee in one post-office case.	10 00
23	H. O. Houghton & Co	Cambridge, Mass., for 30,000 official postal guides furnished April 22, 1875.	6,487 12
30	W. L. Nicholson	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer, for the half month ended April 30, 1875.	925 32
ay 14	W. L. Nicholson	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer, for the half month ended May 15, 1875.	990 57
18	G. W. Durgin	United States deputy marshal, Vancouver, Wash., for fee in one post-office case.	13 00
19	G. B. McCartee	Washington, D. C., for engraving and printing 7,500 drafts and warrants.	161 25
20	P. Melendy	Late United States marshal, Cedar Falls, Iowa, for fee in one post-office case.	29 79
20	J. T. Hoke	Attorney at law, New Creek, W. Va., for fee in one post-office case.	100 00
20	W. S. Lurty	United States attorney, Harrisonburgh, Va., for fees in two post-office cases.	20 00
24	J. T. McConnell	Clerk United States district court, Vancouver, Wash., for fee in one post-office case.	10 90
28	W. L. Nicholson	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer, for the half month ended May 31, 1875.	1,360 15
ine 12	P. Melendy	Late United States marshal, Cedar Falls, Iowa, for fee in one post-office case.	40 00
12	J. R. Wilkins	Clerk United States district court, Beaver City, Utah, for fee in one post-office case.	3 00
12	Houston & Houston	Attorneys at law, Paducah, Ky., for fee in one post-office case.	25 00
12	W. L. Nicholson	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer, for the half month ended June 15, 1875.	881 22
14	William Cary	United States attorney, Provo, Utah, for fee in one post-office case.	10 00

No. 5.—*Amounts paid by the Department on warrants, &c.*—Continued.

Date.	To whom allowed.	For what object.	Amount.
1875.			
June 29	T. P. Ochiltree	Late United States marshal, Galveston, Tex., for fees in eleven post-office cases.	$87 60
29	J. N. Kerns	United States marshal, Philadelphia, Pa., for fees in three post-office cases.	23 30
29	J. H. Pierce	United States marshal, Oxford, Miss., for fees in four post-office cases.	65 12
29	W. L. Nicholson	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer, for the half month ended June 30, 1875.	1,326 39
29	D. McClelland	Washington, D. C., for engraving and printing post-route maps.	1,236 06
July 7	G. H. Reay	New York, N. Y., for post-office envelopes furnished during 2d quarter, 1875.	5,079 63
10	G. F. Nesbitt & Co	New York, N. Y., for 1,034,000 registered-package envelopes furnished during 2d quarter, 1875.	9,068 18
10	A. N. Lewis	New York, N. Y., for royalty on 1,034,000 registered-package envelopes.	517 00
14	W. L. Nicholson	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer, for the half month ended July 15, 1875.	835 00
15	V. S. Lusk	United States attorney, Asheville, N. C., for fee in one post-office case.	20 00
15	J. O. Churchill	Late clerk United States district court, Fort Smith, Ark., for fee in one post-office case.	1 65
15	T. & J. W. Johnson & Co	Philadelphia, Pa., for law-books furnished the Post-Office Department.	23 96
15	D. T. Corbin	United States attorney, Charleston, S. C., for fee in one post-office case.	45 00
15	William Carey	United States attorney, Salt Lake City, Utah, for fees in three post-office cases.	30 00
15	W. W. Dedrick	United States attorney, Jackson, Miss., for fees in two post-office cases.	25 00
15	N. J. Riddick	Clerk United States circuit court, Raleigh, N. C., for fees in five post-office cases.	47 65
15	G. C. Rives	Clerk United States district court, Galveston, Tex., for fees in two post-office cases.	31 20
15	S. Wheeler	Clerk United States district court, Fort Smith, Ark., for fee in one post-office case.	2 85
16	H. O. Houghton & Co	Cambridge, Mass., for 15,000 Official Postal Guides, furnished July 15, 1875.	2,687 23
19	G. W. Wells	United States attorney, Oxford, Miss., for fees in two post-office cases.	20 00
19	G. R. Hill	Clerk United States district court, Oxford, Miss., for fees in seven post-office cases.	38 20
19	J. W. Dimmick	Clerk United States district court, Montgomery, Ala., for fees in twelve post-office cases.	50 75
19	N. W. Trimble	Clerk United States circuit court, Mobile, Ala., for fees in two post-office cases.	31 65
19	J. R. Beckwith	United States attorney, New Orleans, La., for fees in six post-office cases.	105 00
19	J. A. Woolfley	Clerk United States circuit court, New Orleans, La., for fees in ten post-office cases.	162 40
19	S. B. Packard	United States marshal, New Orleans, La., for fees in seven post-office cases.	100 35
19	C. Dart	Clerk United States circuit court, Galveston, Tex., for fees in four post-office cases.	60 98
19	S. R. Harrington	United States attorney, Little Rock, Ark., for fees in six post-office cases.	55 00
19	R. L. Goodrich	Clerk United States circuit court, Little Rock, for fees in six post-office cases.	31 35
19	W. Van Dyke	United States attorney, San Francisco, Cal., for fee in one post-office case.	20 00
19	L. S. B. Sawyer	Clerk United States circuit court, San Francisco, Cal., for fees in six post-office cases.	100 40
30	I. C. Mills	United States marshal, Little Rock, Ark., for fees in four post-office cases.	43 78
30	A. S. Thomas	Clerk United States circuit court, Topeka, Kans., for fees in twelve post-office cases.	91 30
30	N. S. McAfee	United States attorney, Montgomery, Ala., for fees in eleven post-office cases.	195 00
30	V. S. Lusk	United States attorney, Asheville, N. C., for fee in one post-office case.	50 00
30	G. W. Wells	United States attorney, Oxford, Miss., for fee in one post-office case.	20 00
30	W. L. Nicholson	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer, for the half month ended July 31, 1875.	1,392 52

No. 5.—*Amounts paid by the Department on warrants, &c.*—Continued.

Date.	To whom allowed.	For what object.	Amount.
1875.			
ug. 30	W. L. Nicholson	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer, for the month ended August 31, 1875.	$2,213 31
31	G. R. Peck	United States attorney, Topeka, Kans., for fees in six post-office cases.	90 00
pt. 7	G. F. Nesbitt & Co	New York, N. Y., for 538,450 registered-package envelopes furnished in third quarter, 1875.	4,722 20
10	J. G. Wintermith	Attorney at law, Tyler, Texas, for fee in one post-office case.	50 00
15	A. N. Lewis	New York, N. Y., for royalty on 538,459 registered package envelopes.	269 22
20	R. J. Paden	Clerk United States district court, Santa Fé, N. Mex., for fees in five post-office cases.	25 37
21	A. S. Gray	United States marshal, Harrisonburgh, Va., for fees in two post-office cases.	29 00
21	N. J. Riddick	Clerk United States circuit court, Raleigh, N. C., for fee in one post-office case.	10 90
21	W. J. Points	Late clerk United States circuit court, Harrisonburgh, Va., for fee in one post-office case.	12 55
21	D. P. Wheden	Assistant United States attorney, Beaver City, Utah, for fee in one post-office case.	10 00
21	William Patrick	Late United States attorney, Saint Louis, Mo., for fee in one post-office case.	10 00
21	N. Trusler	United States attorney, Indianapolis, Ind., for fee in one post-office case.	10 00
21	R. C. Badger	United States attorney, Raleigh, N. C., for fee in one post-office case.	20 00
21	R. W. Healy	United States marshal, Alabama, for fee in one post-office case.	14 00
29	W. L. Nicholson	Washington, D. C., for incidental expenses incurred in the preparation and publication of post-route maps, including the salaries of assistants to the topographer for the month ended September 30, 1875.	1,999 24

No. 5.—*Amounts paid by the Department on drafts and charged to miscellaneous account.*

1874.			
t. 20	Chase Andrews	Washington, D. C., for amount advanced to pay expenses as a witness in the case of the United States *vs.* T. G. Simms, late postmaster, Atlanta, Ga.	$100 00
ov. 1	E. H. Murray	United States marshal, Louisville, Ky., for fee in one post-office case.	15 60
2	E. W. Early	Clerk United States circuit court, Lynchburgh, Va., for fees in two post-office cases.	17 15
2	H. P. Farrow	United States attorney, Atlanta, Ga., for fees in three post-office cases.	60 00
16	A. P. Eastlake	Washington, D. C., for expenses incurred in connection with the registered-package envelope system.	350 00
ec. 3	D. J. Davidson	Clerk United States district court, Detroit, Mich., for fee in one post-office case.	10 00
21	E. H. Murray	United States marshal, Louisville, Ky., for fee in one post-office case.	26 00
1875.			
n. 22	W. A. Merriwether	Clerk United States circuit court, Louisville, Ky., for fees in two post-office cases.	21 15
23	Ellis & Caldwell	Attorneys at law, Washington, D. C., for legal services in one post-office case.	100 00
30	W. W. Murray	United States attorney, Memphis, Tenn., for fees in two post-office cases.	40 00
30	E. R. Campbell	Clerk United States circuit court, Memphis, Tenn., for commission on moneys collected in three post-office cases.	2 52
b. 17	H. Slack	United States marshal, Kanawha Court-House, W. Va., for fee in one post-office case.	9 50
23	W. C. Robards	Clerk United States circuit court, Tyler, Texas, for commission on moneys collected in one post-office case.	6 48
23	J. W. Dimmick	Clerk United States court, Montgomery, Ala., for fees in fifteen post-office cases.	13 10
23	H. P. Farrow	United States attorney, Atlanta, Ga., for investigating and reporting on lease of building for post-office at Columbus, Ga.	25 00
25	H. E. Andrews	Clerk United States circuit court, Memphis, Tenn., for fees in sundry post-office cases.	46 70

No. 5.—*Amounts paid by the Department on drafts, &c.*—Continued.

Date.		To whom allowed.	For what object.	Amount.
1875.				
Feb.	25	S. H. Jones	Late United States marshal, Memphis, Tenn., for fees in six post-office cases.	$71 20
	25	R. C. Badger	United States attorney, Raleigh, N. C., for fees in four post-office cases.	80 00
Mar.	15	P. Melendy	United States marshal, Keokuk, Iowa, for fee in one post-office case.	16 00
	23	G. W. Wells	United States attorney, Holly Springs, Miss., for fees in two post-office cases.	40 00
	25	William Spence	United States marshal, Nashville, Tenn., for fee in one post-office case.	17 96
	25	J. T. Lane	United States attorney, Davenport, Iowa, for fees in two post-office cases.	25 00
	27	J. W. Knowlton	Washington, D. C., for sundry expenses incurred while traveling as special agent of the Post-Office Department.	79 70
	29	J. B. C. Drew	United States attorney, Pensacola, Fla., for fees in two post-office cases.	60 00
Apr.	15	N. Davis	Attorney at law, Huntsville, Ala., for legal services in one post-office case.	50 00
May	10	A. W. McCullough	Clerk United States circuit court, Huntsville, Ala., for fees in eleven post-office cases.	115 85
June	11	Z. E. Thomas	United States marshal, Huntsville, Ala., for fees in nine post-office cases.	140 58
	11	William Pound	United States attorney, Yankton, Dak., for fee in one post-office case.	10 00
	14	W. H. Smyth	United States marshal, Savannah, Ga., for fees in two post-office cases.	89 47
	16	James Henry	Late United States marshal, Kalamazoo, Mich., for fee in one post-office case.	11 22
	21	S. Patterson	Clerk United States circuit court, Lynchburgh, Va., for fees in two post-office cases.	28 05
July	3	A. P. Eastlake	Washington, D. C., for amount advanced to pay expenses in visiting New York and other offices on business connected with the registered-package envelope system.	75 00
	19	W. A. Merriwether	Clerk United States circuit court, Louisville, Ky., for fee in one post-office case.	34 40
	30	J. H. Standish	United States attorney, Grand Rapids, Mich., for fees in two post-office cases.	40 00
Aug.	12	G. C. Wharton	United States attorney, Louisville, Ky., for fee in one post-office case.	20 00
	24	First National Bank	Portland, Oreg., for charges incurred in transporting four hundred dollars, currency, from Olympia, Wash.	2 00
Sept.	21	J. P. Van Dorston	United States attorney, Springfield, Ill., for fee in one post-office case.	10 00
	21	William Spence	United States marshal, Murfreesborough, Tenn., for fee in one post-office case.	17 96

No. 5.—*Amounts allowed to the postmasters at the principal offices of the United States for incidental expenses of such offices actually and necessarily incurred, such as office-repairs, gas-fixtures, telegraphing, and other miscellaneous expenses.*

Third quarter, 1874	$19,134 05
Fourth quarter, 1874	45,257 33
First quarter, 1875	15,247 63
Second quarter, 1875	16,268 90
Total	95,907 91
Amount paid to postmasters and others	921 05
Amount paid by warrants	116,547 44
Amount paid by drafts	1,877 59
Total	215,253 99
Amount allowed for stationery	39,427 61
Total	254,681 60
Deduct amounts charged to postmasters for overcredits	11 55
Amount actually paid and charged to miscellaneous account	254,670 05

J. M. McGREW, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 22, 1875.

No. 6.—*Statement showing the transactions of the Money-Order Office of the United States during the fiscal year ended June 30, 1875.*

States and Territories.	Number of orders issued.	Balance from last year.	Amount of orders issued.	Revenue.		Drafts and deposits received.	Balance due postmasters.	Transferred from—			
				Total fees received.	Premiums.			Postage-fund.	Swiss fund.	British fund.	German fund.
Alabama	68,307	$17,309 27	$1,236,560 70	$7,586 15	$148 80	$717,736 67	$63 47	$634 93	$72 18	$1,964 52	$5,542 98
Arizona Ter	4,493	11,090 76	161,232 99	846 20	.....	.....	.....	.....	.....	921 14	210 00
Arkansas	46,691	17,411 70	1,076,799 53	6,168 55	.....	406,984 00	4 16	2,029 28	30 90	1,605 23	1,442 13
California	80,316	20,753 12	1,905,842 14	10,827 30	.....	1,424,060 65	88 16	12,031 57	2,464 18	43,900 03	43,938 72
Colorado Ter	34,720	14,426 07	654,085 45	3,894 65	.....	336,408 68	56 58	5,141 34	330 67	41,212 63	2,124 94
Connecticut	81,528	10,139 17	1,165,377 41	7,973 44	.....	438,485 00	22 37	14,654 00	513 95	35,677 18	8,633 46
Dakota Ter	6,798	1,519 58	117,041 55	720 70	.....	9,050 00	98 14	1,180 37	.....	182 50	314 50
Delaware	12,376	1,733 36	173,279 16	1,129 00	.....	3,165 00	.....	5,197 00	390 88	2,878 50	1,556 58
District of Columbia	31,330	8,484 04	581,456 29	3,427 05	.....	1,365,641 71	.....	.....	832 55	8,470 44	6,904 24
Florida	36,843	28,488 03	919,361 62	5,171 85	.....	198,242 90	1 83	350 86	56 77	4,787 19	1,700 27
Georgia	81,480	55,085 76	1,315,484 41	8,292 75	691 53	1,003,954 88	119 21	3,562 00	656 50	6,389 36	8,357 14
Idaho Ter	4,744	7,320 88	156,267 50	837 40	161 36	68,265 28	5 40	1,240 00	97	7,889 70	322 46
Illinois	564,560	90,635 36	7,615,902 63	50,660 95	323 54	7,336,307 51	140 03	37,800 94	5,259 97	49,245 31	34,566 31
Indiana	265,140	44,627 91	3,524,010 66	23,544 00	.....	1,278,749 05	161 28	16,235 19	1,172 59	18,638 14	12,841 33
Indian Territory	719	69 45	17,289 19	97 90	.....	.....	.....	.....	.....	.....	.....
Iowa	343,252	57,074 59	4,753,578 93	31,518 80	.....	1,785,790 60	168 76	13,109 98	936 83	9,688 32	10,515 91
Kansas	130,060	29,808 01	1,965,877 90	12,707 70	.....	829,341 13	315 18	12,797 46	33 39	3,127 28	1,227 77
Kentucky	86,312	15,514 21	1,226,271 97	8,034 80	.....	912,298 00	44 16	5,776 65	493 97	5,123 32	5,761 62
Louisiana	47,261	45,689 17	1,085,795 46	6,176 30	1 25	1,645,114 81	191 35	128 00	409 89	8,896 70	2,179 84
Maine	79,032	20,144 72	1,384,388 60	8,480 90	.....	600,782 00	86 98	7,485 52	198 13	74,616 79	4,926 32
Maryland	60,567	11,098 70	959,462 32	6,042 90	.....	1,338,858 00	4 66	4,963 38	911 13	8,658 06	19,452 35
Massachusetts	180,171	38,850 54	2,912,896 72	18,172 30	.....	1,948,139 75	174 10	40,135 91	997 98	108,771 17	18,035 90
Michigan	279,132	55,385 01	3,873,167 81	25,083 75	.....	1,883,699 00	293 80	13,629 23	2,042 63	47,091 37	16,078 16
Minnesota	101,685	27,735 11	1,645,391 41	10,864 50	.....	664,336 79	1 78	1,508 00	83 60	3,773 22	6,174 28
Mississippi	91,031	33,539 04	1,732,973 30	10,490 45	94 92	9,660 38	.....	1,268 67	40 98	1,131 73	602 99
Missouri	202,064	55,543 55	3,028,465 90	19,478 35	9 21	3,589,891 86	1,070 05	20,521 44	1,320 18	16,485 94	8,223 06
Montana Ter	8,973	4,904 97	188,396 00	1,100 35	.....	92,579 00	.....	25 00	.....	2,041 56	2,703 78
Nebraska	60,292	22,674 73	985,682 66	6,202 60	.....	919,755 00	25 34	16,736 00	61 62	2,013 58	1,993 46
Nevada	11,988	5,276 00	341,846 70	1,863 75	.....	.....	.....	.....	252 51	8,269 21	5,746 46
New Hampshire	59,631	7,870 80	772,670 97	5,048 60	.....	78,825 00	179 20	5,483 68	32	12,922 14	1,596 97
New Jersey	64,691	9,273 19	996,646 98	6,305 75	.....	160,489 00	50 25	18,568 68	401 49	34,739 66	13,941 93
New Mexico Ter	7,233	2,879 04	210,284 43	1,146 15	.....	166,482 02	20 72	30 00	.....	282 51	1,109 03
New York	396,010	183,998 63	5,829,800 12	37,449 45	.....	16,529,273 99	205 18	93,393 97	34,309 46	212,457 54	191,228 05
North Carolina	79,808	18,510 23	1,559,097 21	9,391 15	.....	201,665 00	107 64	3,174 00	27 07	1,725 91	6,309 77
Ohio	399,041	48,211 09	5,179,790 61	34,831 90	.....	3,244,465 05	451 90	99,304 04	2,333 99	50,002 50	31,337 81
Oregon	19,289	16,212 81	387,889 19	2,324 60	.....	281,237 00	34 23	1,434 68	609 33	4,270 14	4,282 72
Pennsylvania	270,172	51,144 84	3,692,457 98	24,379 20	10 96	2,766,634 98	497 93	45,596 34	2,789 58	89,483 92	33,727 18
Rhode Island	25,804	2,870 30	413,848 42	2,580 00	.....	102,986 00	4 04	1,736 00	69 24	26,429 80	3,241 48

No. 6.—*Statement showing the transactions of the Money-Order Office of the United States, &c.*—Continued.

States and Territories.	Number of orders issued.	Balance from last year.	Amount of orders issued.	Revenue.		Drafts and deposits received.	Balance due postmasters.	Transferred from—			
				Total fees received.	Premiums.			Postage-fund.	Swiss fund.	British fund.	German fund.
South Carolina	54,956	$17,674 56	$982,990 18	$6,041 20	$191 26	$578,068 11	.....	$916 84	.....	$1,586 47	$774 40
Tennessee	96,913	46,355 19	1,775,874 34	10,792 50	43 75	1,790,443 34	$37 16	38,522 64	$1,091 51	4,373 48	4,328 01
Texas	98,421	63,404 02	2,013,573 42	11,878 85	29 25	920,793 80	6 91	34,703 55	313 34	8,872 57	8,214 70
Utah Ter	10,590	4,499 55	265,308 23	1,480 25	.....	250 00	6 13	1,617 00	571 81	8,559 51	2,740 39
Vermont	58,200	10,125 60	824,315 74	5,423 05	.....	91,420 00	119 17	6,777 86	17	5,813 21	1,093 20
Virginia	81,974	1[illegible],251 04	1,345,721 04	8,424 15	.....	1,475,818 00	21 52	7,150 89	799 09	12,728 41	6,258 12
Washington Ter	7,105	2,909 10	178,098 38	1,006 05	.....	8,123 00	.....	355 00	.....	1,434 97	1,870 99
West Virginia	32,206	5,673 29	492,357 88	3,151 65	.....	58,950 00	48 44	4,510 72	1 17	3,865 44	1,744 09
Wisconsin	234,140	60,654 17	3,624,042 79	23,116 70	.....	2,176,177 00	209 58	9,936 63	2,782 04	16,773 28	17,800 80
Wyoming Ter	8,254	2,682 44	182,316 76	1,044 90	.....	.....	.....	17 06	.....	1,005 23	51 18
Total	5,006,323	1,326,532 70	77,431,251 58	493,011 44	1,705 83	61,439,398 94	5,166 79	611,412 30	65,667 56	1,020,776 81	563,667 78

No. 6.—*Statement showing the transactions of the Money-Order Office of the United States, &c.*—Continued.

States and Territories.	Number of orders paid.	Amount of orders paid.	Amount of orders repaid.	Transferred to— Postage-fund.	Swiss fund.	British fund.	German fund.	Deposits.	Expenses.	Commissions and clerk-hire.	Balance due the United States.	Miscellaneous.
Alabama	30,291	$588,650 86	$7,005 95	$320 00	$171 00	$503 45	$457 71	$1,366,449 99	$553.38	$5,105 78	$18,401 55	.....
Arizona Ter	655	24,472 33	770 24	.....	.....	1 39	32	137,296 00	.....	343 19	11,417 62	.....
Arkansas	19,640	530,506 56	7,823 48	37,248 72	11 00	539 84	1,701 57	916,396 77	580 54	3,030 98	14,636 02	.....
California	40,626	1,270,724 72	13,517 74	618 32	148 05	2,430 21	3,889 23	2,137,726 65	126 80	8,790 86	25,654 73	$278 56
Colorado Ter	21,020	515,632 51	5,611 40	800 00	.....	1,031 56	1,167 19	517,190 68	118 66	2,525 36	13,603 65	.....
Connecticut	71,019	1,107,024 24	6,381 39	116 00	335 32	1,702 83	3,295 94	547,683 97	63 10	5,128 04	9,697 53	47 62
Dakota Ter	3,228	64,373 76	963 20	200 00	.....	55 10	1,558 56	61,332 79	.....	401 08	1,222 85	.....
Delaware	8,060	127,549 32	655 19	.....	1 05	327 91	111 92	58,166 00	3 00	695 10	1,784 93	35 06
District of Columbia	38,620	607,705 05	3,504 60	.....	70 00	.....	940 00	1,341,276 00	3,259 14	4,434 35	14,027 18	.....
Florida	12,572	320,633 56	4,353 14	191 24	27 60	433 39	272 59	803,683 90	236 06	2,484 15	25,654 64	191 05
Georgia	63,750	1,141,531 63	9,250 60	1,052 49	32 78	797 37	434 40	1,193,989 78	63 05	5,361 59	50,016 59	63 26
Idaho Ter	759	28,125 48	594 65	143,009 00	.....	131 16	580 79	66,091 28	.....	348 42	3,432 63	37 54
Illinois	680,596	9,014,642 16	47,697 93	8,371 21	1,676 80	8,994 48	47,760 24	5,966,682 72	3,400 28	36,491 25	84,771 26	294 22
Indiana	146,524	2,304,529 85	21,114 32	5,092 12	1,185 96	2,911 62	15,028 09	2,516,469 73	519 23	12,785 18	40,198 96	145 09
Indian Territory	83	2,059 49	55 00	.....	.....	.....	.....	15,103 00	.....	37 78	181 27	.....
Iowa	185,739	3,230,527 44	26,195 51	6,039 88	1,310 47	3,973 41	22,480 69	3,297,027 00	137 25	17,101 27	57,371 06	218 74
Kansas	108,199	2,102,226 78	12,782 27	2,758 00	1,056 60	7,974 77	10,266 14	685,321 41	107 46	9,569 53	23,133 27	69 59
Kentucky	90,352	1,584,288 98	7,619 18	.....	222 00	1,311 54	2,754 79	562,213 71	8 06	7,061 20	13,803 15	36 09
Louisiana	50,431	1,256,168 54	6,232 14	65 91	1,098 84	424 66	6,280 22	1,472,509 86	4 66	4,637 23	47,142 02	18 69
Maine	61,050	1,138,387 04	5,720 45	400 00	.....	1,638 99	386 64	928,630 00	64 82	5,525 75	20,312 11	44 16
Maryland	96,685	1,970,048 44	6,216 71	76 14	36 00	1,964 97	4,213.68	346,836 85	39 00	7,412 03	12,607 68	.....
Massachusetts	310,896	4,049,644 54	18,336 29	358 00	199 78	4,818 28	2,646 65	967,040 75	287 95	18,071 25	24,709 66	61 22
Michigan	188,928	3,048,314 40	24,569 83	1,347 23	116 79	4,575 66	19,435 11	2,753,530 10	39 50	13,891 33	50,511 34	139 47
Minnesota	64,128	1,168,354 51	11,421 97	800 00	544 55	2,254 51	24,901 71	1,118,306 00	122 40	6,596 46	26,297 16	69 48
Mississippi	24,950	454,650 70	11,717 09	390 00	56 70	1,057 72	869 72	1,283,031 51	494 19	4,468 97	32,956 12	109 74
Missouri	279,868	5,070,288 78	22,053 49	227 40	2,552 59	3,724 45	18,580 70	1,578,169 72	454 10	19,077 70	25,325 15	555 46
Montana Ter	2,355	67,958 62	1,473 31	.....	.....	23 34	384 64	212,568 00	41 11	554 71	8,746 93	.....
Nebraska	43,648	898,495 54	7,198 82	607 26	198 00	4,051 59	14,165 41	1,005,060 00	7 65	4,674 02	20,549 33	137 37
Nevada	1,656	57,112 03	2,119 77	.....	.....	264 05	446 98	297,815 00	3 50	436 13	5,057 17	.....
New Hampshire	36,291	611,464 32	3,262 07	692 00	.....	774 03	123 80	258,102 00	27 58	3,210 95	6,772 81	168 12
New Jersey	57,286	919,568 25	6,746 92	155 00	615 04	5,123 76	13,683 46	280,744 00	8 00	4,033 44	9,627 29	111 77
New Mexico Ter	1,313	39,726 71	551 02	.....	.....	6 22	81 00	336,147 49	3 75	481 35	5,236 36	.....
New York	942,924	11,496,157 42	49,721 34	266,868 61	30,987 75	679,945 12	275,372 84	10,064,346 14	3,087 60	46,862 65	198,497 11	269 81
North Carolina	32,295	611,325 51	5,735 11	6,790 00	04	649 62	410 53	1,149,540 44	69 60	4,661 89	20,812 88	12 36
Ohio	417,904	5,922,077 02	33,162 29	179,609 00	1,972.05	11,104 27	23,668 40	2,445,808 68	191 04	23,142 29	49,403 24	590 61
Oregon	8,195	235,306 07	2,697 80	168 55	.....	9 95	829 56	441,417 00	37 74	1,587 49	16,232 05	8 49
Pennsylvania	346,757	4,629,606 84	26,013 71	5,228 16	2,704 95	18,824 96	29,235 88	1,928,308 90	3,061 43	19,300 79	43,894 40	542 89
Rhode Island	17,570	326,431 43	2,818 10	.....	76 00	794 73	479 00	218,784 00	38 40	1,463 51	2,880 11	.....

No. 6.—*Statement showing the transactions of the Money Order Office of the United States, &c.*—Continued.

States and Territories.	Number of orders paid.	Amount of orders paid.	Amount of orders repaid.	Transferred to— Postage-fund.	Transferred to— Swiss fund.	Transferred to— British fund.	Transferred to— German fund.	Deposits.	Expenses.	Commissions and clerk-hire.	Balance due the United States.	Miscellaneous.
South Carolina	28,197	$529,235 10	$5,618 06	.....	$0 11	$227 09	$407 56	$1,035,190 11	$18 90	$3,234 45	$14,311 64	.....
Tennessee	79,977	1,537,686 03	12,031 84	$38,205 50	239 39	726 17	1,777 91	2,039,704 03	2,304 21	7,382 40	31,744 29	$63 15
Texas	54,267	1,132,494 35	16,173 74	12,163 00	733 73	1,092 30	11,488 15	1,812,100 80	51 60	5,740 70	69,407 32	344 72
Utah Ter	5,556	145,655 00	1,492 65	425 00	36 00	1,348 30	93 00	130,960 00	.....	923 78	4,099 14	.....
Vermont	35,322	587,261 41	3,003 18	.....	.....	472 54	67 58	339,890 00	.....	3,275 97	11,027 17	90 15
Virginia	67,021	1,172,938 81	7,289 20	156 46	165 00	2,899 25	1,627 97	1,664,720 00	110 15	5,702 32	20,515 46	47 64
Washington Ter	2,424	82,065 65	1,188 05	35 00	.....	203 93	438 72	105,530 00	10 00	540 41	3,785 73	.....
West Virginia	14,969	274,511 68	2,908 45	194 00	545 00	350 32	840 92	282,617 00	25 00	1,436 77	6,853 19	20 35
Wisconsin	155,440	2,821,692 01	21,468 43	1,330 00	3,348 14	7,177 98	51,493 05	2,953,602 00	139 52	14,171 89	56,852 94	217 03
Wyoming Ter	2,711	45,522 28	1,499 38	.....	.....	167 71	287 72	135,376 00	.....	462 09	3,802 39	.....
Total	4,952,747	76,865,353 75	496,337 00	722,109 20	52,475 08	789,816 50	617,418 68	61,776,487 76	19,919 41	354,655 77	1,258,979 08	5,039 50

J. M. McGREW, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY FOR THE POST-OFFICE DEPARTMENT,
Washington, D. C., September 30, 1875.

No. 7.—*Statement of the receipts and disbursements of the Money-Order Office for the fiscal year ended June* 30, 1875.

RECEIPTS.

Balance in the hands of postmasters June 30, 1874	$1,326,532 70
Amount received for money-orders issued	77,431,251 58
Amount received for fees	493,011 44
Amount received for premiums, &c	1,705 83
Amount received for deposits and drafts	61,439,398 94
Amount due postmasters	5,166 79
Amount transferred from postage-fund	611,412 30
Amount transferred from Swiss fund	65,667 56
Amount transferred from British fund	1,020,776 81
Amount transferred from German fund	563,667 78
	142,958,591 73

DISBURSEMENTS.

Amount of money-orders paid	$76,865,353 75	
Amount of money-orders repaid	496,337 00	
Amount transferred to postage-fund	722,109 20	
Amount transferred to Swiss fund	52,475 08	
Amount transferred to British fund	789,816 50	
Amount transferred to German fund	617,418 68	
Amount deposited at first-class offices	61,776,487 76	
Amount paid for incidental expenses	19,919 41	
Amount paid for clerk-hire and commissions	354,655 77	
Miscellaneous items	5,039 50	
Balance in the hands of postmasters June 30, 1875	1,258,979 08	
		142,958,591 73

J. M. McGREW,
Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
Washington, D. C., September 30, 1875.

No. 8.—*Statement showing the revenue which accrued on money-order transactions for the fiscal year ended June* 30, 1875.

Total amount of fees received		$493,011 44
Total amount of premiums, &c., received		1,705 83
		494,717 27
Commissions and clerk-hire	$354,655 77	
Lost remittances	399 00	
Incidental expenses	19,520 41	
Net revenue	120,142 09	
		494,717 27

J. M. McGREW,
Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
Washington, D. C., September 30, 1875.

No. 9.—*Statement showing the transactions of the Money-Order Office of the United States with Switzerland for the fiscal year ended June 30, 1875.*

States and Territories.	Number of orders issued.	Balance from last year.	Amount of orders issued.	Revenue. Total fees received.	Transferred from domestic money-order fund.	Number of orders paid.	Amount of orders paid.	Amount of orders repaid.	Transferred to domestic money-order fund.	Amount paid Switzerland.	Expenses.	Commissions and clerk-hire.	Miscellaneous items.
Alabama	2	$2 75	$68 00	$2 00	$171 00	6	$171 40		$72 18			$0 17	
Arkansas	2		28 00	1 00	11 00	1	9 03		30 90			07	
California	97	4 54	2,467 22	69 75	148 05	9	223 36		2,464 18			2 02	
Colorado Ter	9	17	322 00	8 50					330 67				
Connecticut	23	1 79	526 25	14 75	335 32	14	364 16		513 95				
Delaware	11	77	380 00	10 00	1 05				390 88			94	
District of Columbia	42	19	808 95	23 25	70 00	4	69 84		832 55				
Florida		56 56			27 60	2	27 33		56 77			06	
Georgia	16	50	639 50	16 50	32 78	1	32 70		656 50			08	
Idaho Ter		97							97				
Illinois	284	2 85	5,879 96	170 50	1,676 80	86	2,426 33	$39 83	5,259 97			3 28	$0 70
Indiana	50	5 40	1,134 65	32 00	1,185 96	39	1,178 74	4 96	1,172 59			1 72	
Iowa	45	1 60	928 41	26 50	1,310 47	46	1,328 71		936 83			1 36	08
Kansas	2	1 26	30 60	1 00	1,056 60	38	1,053 81		33 39			2 04	22
Kentucky	19	66	500 75	13 75	222 00	9	243 19		493 97				
Louisiana	19	95	454 50	12 25	1,098 84	38	1,156 41		409 89			24	
Maine	5	25	193 00	5 00					198 13			12	
Maryland	25	54	886 55	23 25	36 00	3	35 21		911 13				
Massachusetts	53	1 46	906 46	28 75	199 78	12	228 47		997 98				
Michigan	98	14 43	1,999 59	57 25	116 79	11	144 89		2,042 63			54	
Minnesota	7	82	83 43	3 00	544 55	17	547 04		83 60			95	21
Mississippi	2		40 00	1 00	56 70	2	56 46		40 98			24	02
Missouri	70	15 75	1,661 70	47 50	2,552 59	103	2,956 86		1,320 18			50	
Montana Ter													
Nebraska	2	41	60 00	1 50	198 00	5	198 29		61 62				
Nevada	10	26	245 00	7 25					252 51				
New Hampshire		32							32				
New Jersey	39	1 19	516 95	17 00	615 04	31	748 37		401 49			32	
New York	1,385	5 56	36,674 88	1,032 50	30,987 75	222	5,569 97	73 25	34,309 46	$27,923 57	$23 75	800 39	30
North Carolina	2	1 34	25 00	75	04				27 07			06	
Ohio	92	5 89	2,411 20	66 75	1,972 05	74	2,121 60		2,333 99			30	
Oregon	16	53	593 05	15 75					609 33				
Pennsylvania	119	4 58	3,144 35	85 50	2,704 95	127	3,146 76		2,789 58			3 04	
Rhode Island	5	31	68 60	2 00	76 00	3	77 67		69 24				
South Carolina					11								11
Tennessee	56	1 82	1,127 78	32 75	239 39	11	306 84		1,094 51			22	17
Texas	15	1 06	303 85	9 25	733 73	22	734 55		313 34				
Utah Ter	21	93	555 50	15 00	36 00	1	35 62		571 81				

Vermont		17							17				
Virginia	24	2 99	787 50	20 25	165 00	6	176 02		799 09			63	
West Virginia		1 08			545 00	20	544 63		1 17			28	
Wisconsin	92	603 24	2,004 87	55 75	3,348 14	117	3,221 52		2,782 04			7 46	98
Wyoming Ter													
Total	2,759	745 89	68,548 05	1,929 50	52,475 08	1,080	29,135 78	118 04	65,667 56	27,923 57	23 75	827 03	2 79

J. M. McGREW, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY FOR THE POST-OFFICE DEPARTMENT,
Washington, D. C., September 30, 1875.

No. 9.—*Statement showing the transactions of the Money-Order Office of the United States with Switzerland for the fiscal year ended June 30, 1875.*

States and Territories.	Number of orders issued.	Balance from last year.	Amount of orders issued.	Revenue. Total fees received.	Transferred from domestic money-order fund.	Number of orders paid.	Amount of orders paid.	Amount of orders repaid.	Transferred to domestic money-order fund.	Amount paid Switzerland.	Expenses.	Commissions and clerk-hire.	Miscellaneous items.
Alabama	2	$2 75	$68 00	$2 00	$171 00	6	$171 40		$72 18			$0 17	
Arkansas	2		28 00	1 00	11 00	1	9 03		30 90			07	
California	97	4 54	2,467 22	69 75	148 05	9	223 36		2,464 18			2 02	
Colorado Ter	9	17	322 00	8 50					330 67				
Connecticut	23	1 79	526 25	14 75	335 32	14	364 16		513 95				
Delaware	11	77	380 00	10 00	1 05				390 88			94	
District of Columbia	42	19	808 95	23 25	70 00	4	69 84		832 55				
Florida		56 56			27 60	2	27 33		56 77			06	
Georgia	16	50	639 50	16 50	32 78	1	32 70		656 50			08	
Idaho Ter		97							97				
Illinois	284	2 85	5,879 96	170 50	1,676 80	86	2,426 33	$39 83	5,259 97			3 28	$0 70
Indiana	50	5 40	1,134 65	32 00	1,185 96	39	1,176 74	4 96	1,172 59			1 72	
Iowa	45	1 60	928 41	26 50	1,310 47	46	1,328 71		936 83			1 36	08
Kansas	2	1 26	30 60	1 00	1,056 60	38	1,053 81		33 39			2 04	22
Kentucky	19	66	500 75	13 75	222 00	9	243 19		493 97				
Louisiana	19	95	454 50	12 25	1,098 84	38	1,156 41		409 89			24	
Maine	5	25	193 00	5 00					198 13			12	
Maryland	25	54	886 55	23 25	36 00	3	35 21		911 13				
Massachusetts	53	1 46	996 46	28 75	199 78	12	228 47		997 98				
Michigan	98	14 43	1,999 59	57 25	116 79	11	144 89		2,042 63			54	
Minnesota	7	82	83 43	3 00	544 55	17	547 04		83 60			95	21
Mississippi	2		40 00	1 00	56 70	2	56 46		40 98			24	02
Missouri	70	15 75	1,661 70	47 50	2,552 59	103	2,956 86		1,320 18			50	
Montana Ter													
Nebraska	2	41	60 00	1 50	198 00	5	198 29		61 62				
Nevada	10	26	245 00	7 25					252 51				
New Hampshire		32							32				
New Jersey	39	1 19	516 95	17 00	615 04	31	748 37		401 49			32	
New York	1,385	5 56	36,674 88	1,032 50	30,987 75	222	5,569 97	73 25	34,309 46	$27,923 57	$23 75	800 39	30
North Carolina	2	1 34	25 00	75	04				27 07			06	
Ohio	92	5 89	2,411 20	66 75	1,972 05	74	2,121 60		2,333 99			30	
Oregon	16	53	593 05	15 75					609 33				
Pennsylvania	119	4 58	3,144 35	85 50	2,704 95	127	3,146 76		2,789 58			3 04	
Rhode Island	5	31	68 60	2 00	76 00	3	77 67		69 24				
South Carolina				11									11
Tennessee	56	1 82	1,127 78	32 75	239 39	11	306 84		1,094 51			22	17
Texas	15	1 06	303 85	9 25	733 73	22	734 55		313 34				
Utah Ter	21	93	555 50	15 00	36 00	1	35 62		571 81				

Vermont		17							17				
Virginia	24	2 99	787 50	20 25	165 00	6	176 02		799 09			63	
West Virginia		1 08			545 00	20	544 63		1 17			28	
Wisconsin	92	603 24	2,004 87	55 75	3,348 14	117	3,221 52		2,782 04			7 46	98
Wyoming Ter													
Total	2,759	745 89	68,548 05	1,929 50	52,475 08	1,080	29,135 78	118 04	65,667 56	27,923 57	23 75	827 03	2 79

J. M. McGREW, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY FOR THE POST-OFFICE DEPARTMENT,
Washington, D. C., September 30, 1875.

No. 10.—*Statement of the receipts and disbursements of the Money-Order Office with Switzerland for the fiscal year ended June* 30, 1875.

RECEIPTS.

Balance in hands of postmasters June 30, 1874	$745 89
Amount received for money-orders issued	68,548 05
Amount received for fees	1,929 50
Amount transferred from domestic fund	52,475 08
	123,698 52

DISBURSEMENTS.

Amount of money-orders paid	$29,135 78	
Amount of money-orders repaid	118 04	
Amount transferred to domestic fund	65,667 56	
Amount paid Switzerland	27,923 57	
Amount paid for incidental expenses	23 75	
Amount paid for commissions and clerk-hire	827 03	
Miscellaneous items	2 79	
		123,698 52

J. M. McGREW,
Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
Washington, D. C., September 30, 1875.

No. 11.—*Statement showing the revenue which accrued on money-order transactions with Switzerland for the fiscal year ended June* 30, 1875.

Amount of fees received on orders issued		$1,929 50
Commissions and clerk-hire	$827 03	
Excess of commissions paid Switzerland	399 61	
Incidental expenses	23 75	
Net revenue	679 11	
		1,929 50

J. M. McGREW,
Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
Washington, D. C., October 16, 1875.

ended June 30, 1875.

States and Territories.	Number of orders issued.	Balance from last year.	Amount of orders issued.	Revenue. Total fees received.	Transferred from domestic money-order fund.	Amount received from assignees of Jay Cooke & Co.	Number of orders paid.	Amount of orders paid.	Amount of orders repaid.	Transferred to domestic money-order fund.	Amount paid United Kingdom.	Expenses.	Commissions and clerk-hire.	Miscellaneous items.
Alabama	78	$2 08	$2,026 05	$54 75	$503 45	.....	28	$610 41	$10 00	$1,964 52	.....	.....	$1 00	$0 40
Arizona Ter	25	1 70	898 25	23 25	1 39	.....	.....	.....	.....	921 14	.....	$1 25	2 20	.....
Arkansas	59	60	1,632 30	44 50	539 84	.....	31	611 01	.....	1,605 23	.....	.....	92	08
California	2,304	164 20	46,657 59	1,389 25	2,430 21	.....	319	6,526 32	152 05	43,900 03	.....	.....	43 92	18 93
Colorado Ter	1,784	50	41,712 75	1,156 50	1,031 56	.....	126	2,583 13	.....	41,212 63	.....	.....	97 19	8 36
Connecticut	2,474	53 74	38,696 77	1,222 75	1,702 83	.....	334	5,678 39	257 20	35,677 18	.....	.....	46 88	16 44
Dakota Ter	10	18	180 00	5 25	55 10	.....	6	57 45	.....	182 50	.....	.....	58	.....
Delaware	162	.....	3,344 48	98 00	327 91	.....	44	780 33	100 00	2,878 50	.....	.....	10 32	1 24
District of Columbia	531	39	9,486 95	289 25	.....	.....	68	1,219 48	86 67	8,470 44	.....	.....	.....	.....
Florida	169	2 09	4,838 66	133 00	433 39	.....	22	444 77	159 30	4,787 19	.....	.....	13 18	2 70
Georgia	301	20 17	6,556 41	185 00	797 37	.....	56	1,123 66	45 00	6,389 36	.....	.....	93	.....
Idaho Ter	231	.....	7,713 15	211 25	131 16	.....	7	134 63	.....	7,889 70	.....	.....	19 62	11 61
Illinois	3,680	259 09	64,394 44	1,955 50	8,994 48	.....	1,310	25,949 29	180 13	49,245 31	.....	.....	207 09	21 69
Indiana	1,069	108 39	19,585 56	585 00	2,911 62	.....	217	4,432 49	51 20	18,638 14	.....	.....	21 25	47 49
Iowa	603	105 05	10,418 06	325 75	3,973 41	.....	258	5,061 58	43 00	9,688 32	.....	.....	21 82	7 55
Kansas	263	45 39	3,839 86	111 75	7,974 77	.....	421	8,817 88	.....	3,127 28	.....	.....	24 17	2 44
Kentucky	295	35 96	5,797 00	173 75	1,311 54	.....	104	2,143 91	26 40	5,123 32	.....	15 00	9 31	31
Louisiana	386	132 05	10,380 85	283 25	424 66	.....	114	2,301 84	20 00	8,896 70	.....	.....	2 28	.....
Maine	2,381	5 31	73,957 86	1,949 50	1,638 99	.....	125	2,653 82	64 15	74,616 79	.....	.....	175 29	41 61
Maryland	626	41 30	9,954 94	311 75	1,964 97	.....	199	3,427 15	171 75	8,658 06	.....	.....	13 11	2 89
Massachusetts	7,644	123 76	126,083 37	3,942 25	4,818 28	.....	1,530	25,124 99	388 27	108,771 17	.....	.....	669 07	14 16
Michigan	2,751	55 56	56,352 80	1,500 50	4,575 66	.....	446	9,089 92	141 00	47,091 37	.....	.....	95 54	66 69
Minnesota	251	68 72	4,203 70	127 25	2,254 51	.....	143	2,787 00	82 00	3,773 22	.....	.....	8 06	3 90
Mississippi	58	71	1,179 30	35 25	1,057 72	.....	48	1,130 16	.....	1,131 73	.....	.....	4 62	6 47
Missouri	1,072	179 51	21,337 42	623 50	3,724 45	.....	436	9,271 35	25 00	16,485 94	.....	.....	71 19	11 40
Montana Ter	67	69	2,017 25	54 25	23 34	.....	4	51 57	2 00	2,041 56	.....	.....	33	07
Nebraska	187	3 37	2,896 72	89 00	4,051 59	.....	238	4,991 20	20 00	2,013 58	.....	.....	14 51	1 39
Nevada	399	28 18	8,226 45	253 50	264 05	.....	20	495 14	.....	8,269 21	.....	.....	4 67	3 16
New Hampshire	714	60 65	12,992 97	390 50	774 03	.....	68	1,242 86	11 00	12,922 14	.....	.....	35 53	6 62
New Jersey	3,125	82 81	45,281 62	1,486 75	5,123 76	.....	1,016	16,984 08	135 72	34,739 66	.....	.....	75 61	39 87
New Mexico Ter	9	64	274 50	7 25	6 22	.....	1	5 41	.....	282 51	.....	.....	69	.....
New York	15,712	128 45	252,946 39	8,054 50	679,945 12	.....	5,018	84,259 67	1,056 89	212,457 54	$622,372 93	149 32	20,761 59	16 52
North Carolina	78	4 80	1,782 58	51 25	649 62	.....	37	755 29	.....	1,725 91	.....	.....	6 34	71
Ohio	3,278	114 95	58,625 21	1,784 25	11,104 27	.....	1,074	21,260 46	216 40	50,002 50	.....	7 70	80 65	60 97
Oregon	186	1 68	4,199 24	119 75	9 95	.....	8	54 69	.....	4,270 14	.....	.....	5 30	49
Pennsylvania	6,136	509 64	98,032 89	3,067 75	18,824 96	$18,847 99	2,625	48,956 83	427 05	89,483 92	.....	.....	385 01	30 42

No. 12.—*Statement showing the transactions of the Money-Order Office of the United States with the Kingdom of Great Britain, &c.*—Continued.

States and Territories.	Number of orders issued.	Balance from last year.	Amount of orders issued.	Revenue. Total fees received.	Transferred from domestic money-order fund.	Amount received from assignees of Jay Cooke & Co.	Number of orders paid.	Amount of orders paid.	Amount of orders repaid.	Transferred to domestic money-order fund.	Amount paid United Kingdom.	Expenses.	Commissions and clerk-hire.	Miscellaneous items.
Rhode Island	1,679	$10 56	$28,687 27	$895 75	$794 73	.....	226	$3,870 68	$72 36	$26,429 80	.....	.....	$9 31	$6 16
South Carolina	47	83	1,675 40	43 00	227 09	.....	19	350 62	.....	1,586 47	.....	.....	4 13	5 10
Tennessee	226	6 98	4,623 76	136 50	726 17	.....	58	1,107 63	10 00	4,373 48	.....	.....	2 29	01
Texas	388	34 99	9,569 40	262 75	1,092 30	.....	102	2,082 96	.....	8,872 57	.....	.....	2 34	1 57
Utah Ter	567	75 53	9,826 67	294 50	1,348 30	.....	138	2,964 61	10 00	8,559 51	.....	.....	9 51	1 37
Vermont	353	28 41	5,674 39	180 00	472 54	.....	33	526 02	.....	5,813 21	.....	.....	15 48	63
Virginia	648	17 94	14,489 19	409 50	2,899 25	.....	231	4,968 54	83 00	12,728 41	.....	$1 25	11 74	22 94
Washington Ter	53	.....	1,521 96	42 00	203 93	.....	13	272 58	54 50	1,434 97	.....	25	4 45	1 14
West Virginia	204	.....	3,857 75	114 75	350 32	.....	25	448 12	.....	3,865 44	.....	.....	8 24	1 02
Wisconsin	921	102 25	15,871 41	480 75	7,177 98	.....	319	6,688 17	130 25	16,773 28	.....	.....	35 55	5 14
Wyoming Ter	48	.....	1,080 75	30 25	167 71	.....	12	244 72	25 00	1,005 23	.....	.....	3 31	45
Total	64,172	2,619 80	1,149,382 29	34,986 25	789,816 50	$18,847 99	17,677	324,542 80	4,257 29	1,020,776 81	$622,372 93	174 77	23,036 12	492 11

J. M. McGREW, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
Washington, D. C., September 30, 1875.

No. 13.—*Statement of the receipts and disbursements of the Money-Order Office with the United Kingdom of Great Britain and Ireland for the fiscal year ended June* 30, 1875.

RECEIPTS

Balance in hands of postmasters June 30, 1874	$2,619 80
Amount received for money-orders issued	1,149,382 29
Amount received for fees	34,986 25
Amount transferred from domestic fund	789,816 50
Amount received from assignees of Jay Cooke & Co	18,847 99
	1,995,652 83

DISBURSEMENTS.

Amount of money-orders paid	$324,542 80	
Amount of money-orders repaid	4,257 29	
Amount transferred to domestic fund	1,020,776 81	
Amount paid United Kingdom	622,372 93	
Amount paid for incidental expenses	174 77	
Amount paid for commissions and clerk-hire	23,036 12	
Miscellaneous items	492 11	
		1,995,652 83

J. M. McGREW,
Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
Washington, D. C., September 30, 1875.

No. 14.—*Statement showing the revenue which accrued on money-order transactions with the United Kingdom of Great Britain and Ireland for the fiscal year ended June* 30, 1874.

Amount of fees received on orders issued		$44,508 75
Commissions and clerk-hire	$20,858 44	
Excess of commissions paid United Kingdom	11,812 64	
Incidental expenses	462 95	
Net revenue	11,374 72	
		44,508 75

J. M. McGREW,
Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
Washington, D. C., September 30, 1875.

No. 15—*Statement showing the transactions of the Money-Order Office of the United States with the German Empire for the fiscal year ended June 30, 1875.*

States and Territories.	Number of orders issued.	Balance from last year.	Amount of orders issued.	Revenue. Total fees received.	Transferred from domestic money-order fund.	Balance due postmasters.	Number of orders paid.	Amount of orders paid.	Amount of orders repaid.	Transferred to domestic money-order fund.	Amount paid German Empire.	Expenses.	Commissions and clerk-hire.	Balance due the United States.	Miscellaneous items.
Alabama	213	$2 31	$5,980 75	$160 45	$457 71	.....	42	$1,058 17	.....	$5,542 98	.....	.....	$0 07	.....	.....
Arizona Ter	5	1 00	204 00	5 25	32	.....	.....	.....	.....	210 00	.....	.....	51	.....	$0 06
Arkansas	73	1 45	1,565 15	43 05	1,701 57	.....	68	1,867 13	.....	1,442 13	.....	.....	1 96	.....	.....
California	1,861	174 87	50,911 51	1,383 35	3,889 23	.....	450	12,195 93	$171 50	43,938 72	.....	$1 15	44 36	.....	7 30
Colorado Ter	109	57	2,740 30	74 80	1,167 19	.....	65	1,857 63	.....	2,124 94	.....	.....	28	.....	01
Connecticut	534	4 76	10,146 33	280 30	3,295 94	.....	196	5,060 49	26 00	8,633 46	.....	50	6 57	.....	31
Dakota Ter	15	81	302 00	8 05	1,558 56	.....	54	1,550 25	.....	314 50	.....	.....	4 67	.....	.....
Delaware	54	.....	1,556 90	41 40	111 92	.....	5	149 09	.....	1,556 58	.....	.....	4 26	.....	29
District of Columbia	383	18	9,611 72	258 90	940 00	.....	151	3,906 56	.....	6,904 24	.....	.....	.....	.....	.....
Florida	61	2 38	1,634 00	43 10	272 59	.....	7	246 83	.....	1,700 27	.....	.....	4 68	.....	29
Georgia	267	157 02	8,284 05	216 55	434 40	.....	26	684 70	50 00	8,357 14	.....	.....	18	.....	.....
Idaho Ter	10	41	315 25	8 15	580 79	.....	21	579 59	.....	322 46	.....	.....	2 23	.....	32
Illinois	3,381	202 69	59,635 17	1,663 50	47,760 24	.....	2,819	74,324 99	119 27	34,506 31	.....	1 00	243 06	.....	66 97
Indiana	830	91 62	14,400 85	404 20	15,028 09	.....	640	16,943 24	97 60	12,841 33	.....	75	37 80	.....	4 04
Iowa	670	225 16	12,635 96	345 25	22,480 69	.....	912	24,961 34	138 00	10,515 91	.....	1 90	60 42	.....	9 49
Kansas	89	1 68	1,752 80	47 65	10,266 14	.....	397	10,800 19	20 00	1,227 77	.....	50	17 40	.....	2 41
Kentucky	339	16 24	7,394 84	202 60	2,754 79	.....	187	4,597 49	.....	5,761 62	.....	.....	9 01	.....	35
Louisiana	184	141 02	3,979 78	108 30	6,280 22	.....	315	8,303 08	20 00	2,179 84	.....	.....	6 32	.....	08
Maine	139	1 24	4,804 70	123 00	386 64	.....	16	385 03	.....	4,926 32	.....	.....	4 23	.....	.....
Maryland	1,233	24	24,753 60	676 15	4,213 68	.....	425	10,059 93	123 00	19,452 35	.....	.....	7 26	.....	1 13
Massachusetts	1,029	40 98	22,186 97	610 70	2,646 65	.....	279	7,287 63	60 50	18,035 90	.....	.....	100 93	.....	34
Michigan	1,324	82 81	24,880 20	690 50	19,435 11	.....	1,081	28,816 84	138 60	16,078 16	.....	90	45 19	.....	8 93
Minnesota	433	303 56	7,889 63	215 45	24,901 71	.....	964	26,259 45	792 45	6,174 28	.....	2 50	65 91	.....	15 76
Mississippi	32	94	714 00	19 15	869 72	.....	35	998 11	.....	602 99	.....	.....	2 41	.....	30
Missouri	859	105 23	18,732 18	510 70	18,580 70	.....	1,136	29,531 48	60 00	8,223 06	.....	15	107 63	.....	6 49
Montana Ter	77	1 41	2,636 95	68 15	384 64	.....	14	383 51	.....	2,703 78	.....	.....	2 89	.....	97
Nebraska	142	41 80	3,051 80	81 90	14,165 41	.....	550	15,255 45	55 00	1,993 46	.....	.....	32 86	.....	4 14
Nevada	178	68	5,839 34	156 30	446 98	.....	25	680 57	15 00	5,746 46	.....	.....	75	.....	52
New Hampshire	93	1 91	1,616 87	45 70	123 80	.....	8	174 46	11 12	1,596 97	.....	50	4 46	.....	77
New Jersey	1,237	35 51	24,756 35	677 40	13,683 46	.....	1,006	25,093 29	60 10	13,941 93	.....	50	48 01	.....	8 89
New Mexico Ter	27	.....	1,061 50	27 50	81 00	.....	5	58 12	.....	1,109 03	.....	.....	2 81	.....	04
New York	11,382	48 98	245,090 14	6,776 60	275,372 84	.....	5,664	137,177 08	700 47	191,228 05	189,474 86	151 58	8,554 95	.....	1 57
North Carolina	172	2 60	6,260 75	160 95	410 53	.....	18	504 68	.....	6,309 77	.....	.....	16 88	.....	3 50
Ohio	2,383	214 35	43,550 93	1,206 00	23,668 40	.....	1,416	37,013 99	156 60	31,337 81	.....	2 25	123 94	.....	5 09
Oregon	169	21 40	4,344 20	120 65	829 56	.....	41	1,029 99	.....	4,282 72	.....	.....	3 10	.....	.....
Pennsylvania	2,350	236 49	51,210 12	1,384 50	29,235 88	.....	1,874	47,743 31	487 00	33,727 18	.....	8 05	93 00	.....	8 45
Rhode Island	.....	1 25	3,477 85	93 40	479 00	.....	36	810 02	.....	3,241 48	.....	.....	.....	.....	.....

South Carolina	31	36	871 60	22 90	407 56	.....	20	524 60	.....	774 40	.....	.....	2 06	.....	76
Tennessee	181	27 64	4,705 57	126 45	1,777 91	.....	83	2,307 84	.....	4,328 01	.....	.....	1 53	.....	19
Texas	589	442 63	12,924 16	353 75	11,488 15	.....	610	16,928 36	33 10	8,214 70	.....	65	26 97	.....	4 91
Utah Ter	74	32	2,677 00	68 90	93 00	.....	4	98 79	.....	2,740 39	.....	.....	04	.....	.....
Vermont	27	1 61	1,063 25	28 00	67 58	.....	5	64 39	.....	1,093 20	.....	.....	2 82	.....	03
Virginia	280	25 54	6,849 30	184 55	1,627 97	.....	99	2,420 52	5 00	6,258 12	.....	.....	3 22	.....	50
Washington Ter	55	1 06	1,810 72	47 80	438 72	.....	18	421 72	.....	1,870 99	.....	.....	5 59	.....	.....
West Virginia	113	1 27	2,116 80	58 65	840 92	.....	55	1,272 82	.....	1,744 09	.....	.....	73	.....	.....
Wisconsin	1,459	383 87	23,667 30	666 45	51,493 05	.....	2,140	58,080 81	201 01	17,800 80	.....	1 00	109 92	.....	17 13
Wyoming Ter	1	32	50 00	1 25	287 72	.....	11	287 27	.....	51 18	.....	.....	84	.....	.....
Total	35,319	3,050 17	746,644 54	20,498 25	617,418 68	.....	23,993	620,756 76	3,541 32	563,667 78	189,474 86	173 88	9,814 71	.....	182 33

J. M. McGREW, *Auditor.*

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
Washington, D. C., September 30, 1875.

No. 16.—*Statement of the receipts and disbursements of the Money-Order Office with the German Empire for the fiscal year ended June 30, 1875.*

RECEIPTS.

Balance in hands of postmasters June 30, 1874	$3,050 17
Amount received for money-orders issued	746,644 54
Amount received for fees	20,498 25
Amount transferred from domestic fund	617,418 68
	1,387,611 64

DISBURSEMENTS.

Amount of money-orders paid	$620,756 76	
Amount of money-orders repaid	3,541 32	
Amount transferred to domestic fund	563,667 78	
Amount paid German Empire	189,474 86	
Amount paid for incidental expenses	173 88	
Amount paid for commissions and clerk-hire	9,814 71	
Miscellaneous items	182 33	
		1,387,611 64

J. M. McGREW,
Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
Washington, D. C., September 30, 1875.

No. 17.—*Statement showing the revenue which accrued on money-order transactions with the German Empire for the fiscal year ended June 30, 1874.*

Amount of fees received on orders issued		$19,288 95
Commissions and clerk-hire	$7,059 95	
Excess of commissions paid German Empire	2,976 57	
Incidental expenses	121 55	
Net revenue	9,130 88	
		19,288 95

J. M. McGREW,
Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT,
Washington, D. C., September 30, 1875.

No. 18.—*Amount of letter-postage on British mails received in and sent from the United States during the fiscal year ended June 30, 1875.*

RECEIVED.

Lines.	Unpaid.	Unpaid distributed.	Paid.	Paid distributed.	Total.
Cunard line	$7,294 61	$14,775 21	.....	$142,038 33	$164,108 15
Dale, or Inman line	4,382 71	9,594 54	.....	82,259 20	96,236 45
North German Lloyd of Bremen	3,058 14	7,629 91	.....	51,201 73	61,889 78
Canadian line	1 08	2 38	.....	126 18	129 64
White Star line	18 82	21 00	.....	1,853 82	1,893 64
Liverpool and Great Western Steam Company	.....	.....	.....	68	68
American Steamship Company	3 32	3 32	.....	1 48	4 80
National line	.....	.....	.....	24	24
Total	14,758 68	32,023 04	.....	277,481 66	324,263 38
Amount received	46,781 72	.....	$277,481 66	.....	.....

SENT.

Lines.	Paid.	Paid distributed.	Paid stamps.	Unpaid.	Total.
Cunard line	$3,953 60	$97,544 94	.....	$7,572 62	$109,071 16
Liverpool and Great Western Steam Company	159 74	28,774 49	.....	2,353 86	31,288 09
Hamburg-American Packet Company	3,473 06	40,284 37	.....	4,483 66	48,241 09
Canadian line	.....	12,107 36	.....	540 84	12,648 20
White Star line	3,277 68	57,309 34	.....	3,690 79	64,277 81
North German Lloyd of Bremen	3,531 58	17,648 58	.....	1,244 25	22,424 41
Dale, or Inman line	3,001 24	24,318 81	.....	1,605 84	27,925 89
Eagle line	425 80	21,438 74	.....	1,623 97	23,488 51
American Steamship Company	.....	3,275 52	.....	163 90	3,439 42
National line	.....	389 09	.....	21 34	410 43
Dominion line	.....	2,830 95	$52 16	122 40	3,005 51
Anchor line	36 12	1,571 46	.....	97 80	1,705 38
Total	16,858 82	307,493 65	52 16	23,521 27	347,925 90
Amount sent	324,352 47	.....	23,573 43	.....	.....

Amount collected in the United States	$371,134 19
Amount collected in the United Kingdom	301,055 09
Total	672,189 28
Excess collected in the United States	70,079 10
Decrease compared with last fiscal year	122,241 17

J. M. McGREW,
Auditor.

OFFICE OF THE AUDTTOR OF THE TREASURY
FOR THE POST-OFFICE DEEARTMENT, *October* 22, 1875.

No. 19.—*Amount of letter-postage on German mails received in and sent from the United States during the fiscal year ended June 30, 1875.*

RECEIVED.

Lines.	Unpaid.	Unpaid distributed.	Paid.	Paid distributed.	Total.
Cunard line, via England	$1,843 81	$5,394 50	.....	$12,872 59	$20,110 90
Dale, or Inman line, via England	2,366 64	8,521 01	.....	12,860 10	23,747 75
North German Lloyd, of Bremen, via England	2,081 08	6,548 68	.....	14,090 86	22,720 62
Hamburg-American Packet Company, via France	1,060 37	3,261 30	.....	2,825 94	7,147 61
French line	46 78	170 34	.....	108 97	326 09
North German Lloyd, of Bremen, direct	1,036 83	3,219 70	.....	38,689 98	42,946 51
Hamburg-American Packet Company, direct	1,426 04	4,473 25	.....	47,849 30	53,748 59
Eagle line, direct from Hamburg	126 20	434 50	.....	4,441 97	5,002 67
Baltic Lloyd, direct from Stettin	12	.....	.....	66	78
Total	9,987 87	32,023 28	.....	133,740 37	175,751 52
Amount received	42,011 15	.....	$133,740 37	.....	.....

SENT.

Lines.	Paid.	Paid distributed.	Paid stamps.	Unpaid.	Total.
Cunard line, via England	$713 53	$16,057 27	.....	$2,089 39	$18,860 24
Dale, or Inman line, via England	.....	126 62	.....	16 80	143 42
Liverpool and Great Western Steam Company, via England	95 88	5,542 32	.....	1,281 68	6,919 88
North German Lloyd, of Bremen, via England	2,697 42	21,145 27	.....	1,007 10	24,849 79
Hamburg-American Packet Company, via England	1,615 99	12,541 50	.....	879 87	15,037 36
Eagle line, via England	206 62	7,273 29	.....	222 92	7,702 83
North German Lloyd, of Bremen, direct	963 43	48,996 44	.....	6,215 36	56,175 23
Hamburg-American Packet Company, direct	562 08	44,244 07	.....	5,443 57	50,249 72
Eagle line, direct to Hamburg	81 72	10,545 15	.....	1,786 53	12,413 40
Baltic Lloyd, direct to Stettin	.....	48	.....	24	72
White Star line, via England	118 15	2,307 89	.....	154 28	2,580 32
Dominion line, via England	5 92	500 88	.....	48 51	555 31
Total	7,060 79	169,281 18	.....	19,146 25	195,488 22
Amount sent	176,341 97	.....	.....	19,146 25	.....

Amount collected in the United States	$218,353 12
Amount collected in Germany	152,886 62
Total	371,239 74
Excess collected in the United States	65,466 50
Decrease compared with the last fiscal year	28,572 13

J. M. McGREW,
Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 22, 1875.

No. 20.—*Amount of letter-postage collected on French mails received in and sent from the United States during the fiscal year ended June 30, 1875.*

RECEIVED.

Lines.	Unpaid distributed.	Unpaid.	Paid.	Paid distributed.	Total.
Dale, or Inman line, via England	$1,851 33	$1,056 02	.....	$15,986 51	$18,893 86
Cunard line	748 43	866 72	.....	8,799 15	10,414 30
Hamburg-American Packet Company	801 29	539 81	.....	6,841 33	8,182 43
North German Lloyd of Bremen	1,990 74	1,350 71	.....	15,296 34	18,637 79
French Steamship Company	1,222 63	639 56	.....	7,226 20	9,088 39
Total	6,614 42	4,452 82	.....	54,149 53	65,216 77
Amount received	.....	11,067 24	$54,149 53	.....	.....

SENT.

Lines.	Paid.	Paid distributed.	Paid stamps.	Unpaid.	Total.
Liverpool and Great Western Steam Company	$20 52	$3,405 40	.....	$692 97	$4,118 89
National line	.....	21 87	.....	2 07	23 94
Eagle line	89 50	4,960 56	.....	810 65	5,860 71
North German Lloyd of Bremen	846 36	6,422 05	.....	1,218 46	8,486 87
Cunard line	471 24	11,855 16	.....	1,699 66	14,026 06
Hamburg-American Packet Company	871 18	7,396 20	.....	1,911 22	10,178 60
French Steamship Company	356 04	7,722 43	.....	1,001 28	9,079 75
White Star line	.....	980 42	.....	121 63	1,102 05
Dale, or Inman line	19 98	462 38	.....	38 40	520 76
Dominion line	8 10	396 90	.....	39 84	444 84
Total	2,682 92	43,623 37	.....	7,536 18	53,842 47
Amount sent	46,306 29	.....	.....	7,536 18	.....

Amount collected in the United States	$57,373 53
Amount collected in France	61,685 71
Total	119,059 24
Excess collected in France	4,312 28
Amount collected in France last fiscal year	unknown

J. M. McGREW,
Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 22, 1875.

No. 21.—*Amount of letter-postage collected on Belgian mails received in and sent from the United States during the fiscal year ended June 30, 1875.*

RECEIVED.

Lines.	Unpaid.	Unpaid distributed.	Paid.	Paid distributed.	Total.
Cunard line	$370 50	$581 39	.....	$2,607 89	$3,559 78
Dale, or Inman line	293 78	492 25	.....	1,894 44	2,680 47
North German Lloyd of Bremen	289 35	413 66	.....	1,784 70	2,487 71
Red Star line	1 03	2 85	.....	328 06	331 94
Total	954 66	1,490 15	.....	6,615 09	9,059 90
Amount received	2,444 81	.....	$6,615 09	.....	.....

SENT

Lines.	Paid.	Paid distributed.	Paid stamps.	Unpaid.	Total.
Liverpool and Great Western Steam Company	$0 80	$289 58	.....	$135 56	$425 94
North Germany Lloyd of Bremen	193 92	1,462 33	.....	407 67	2,063 92
Hamburg-American Packet Company	130 08	845 02	.....	284 38	1,259 48
Cunard line	56 96	1,193 44	.....	304 63	1,555 03
Dale, or Inman line	.....	8 72	.....	2 00	10 72
Eagle line	13 60	372 38	.....	138 89	524 87
Red Star line	.....	89 70	.....	1 68	91 38
White Star line	6 88	158 04	.....	39 18	204 10
Dominion line	32	28 22	.....	10 12	38 66
National line	.....	2 24	.....	44	2 68
Total	402 56	4,449 67	.....	1,324 55	6,176 78
Amount sent	4,852 23	.....	.....	1,324 55	.....

Amount collected in Belgium	$7,939 64
Amount collected in the United States	7,297 04
Total	15,236 68
Excess collected in Belgium	642 60
Increase compared with last fiscal year	1,244 29

J. M. McGREW,
Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 22, 1875.

No. 22.—*Amount of letter-postage on Netherlands mails received in and sent from the United States during the fiscal year ended June 30, 1875.*

RECEIVED.

Lines.	Unpaid distributed.	Unpaid.	Paid.	Paid distributed.	Total.
Cunard line	$580 70	$42 15	$2,576 07	.....	$3,198 92
Dale, or Inman line	898 08	49 45	2,952 03	.....	3,899 56
North German Lloyd of Bremen	642 75	35 05	2,039 30	.....	2,717 10
Netherlands Steam Navigation Company	12 05	8 91	226 74	.....	247 70
Total	2,133 58	135 56	7,794 14	.....	10,063 28
Amount received	.....	2,269 14	7,794 14	.....	.....

SENT.

Lines.	Paid.	Paid distributed.	Paid stamps.	Unpaid.	Total.
Liverpool and Great Western Steam Company	.....	$609 00	.....	$124 92	$733 92
Dale, or Inman line	.....	14 00	.....	3 10	17 10
North German Lloyd of Bremen	.....	2,597 20	.....	567 75	3,164 95
Hamburg-American Packet Company	.....	1,608 70	.....	320 49	1,929 19
Cunard line	.....	1,898 00	.....	337 75	2,235 75
Eagle line	.....	826 30	.....	233 75	1,060 05
Netherlands Steam Navigation Company	.....	241 14	.....	3 24	244 38
White Star line	.....	283 80	.....	72 94	356 74
Dominion line	.....	51 20	.....	6 90	58 10
Total	.....	8,129 34	.....	1,670 84	9,800 18
Amount sent	$8,129 34	.....	.....	1,670 84	.....

Amount collected in the United States	$10,398 48
Amount collected in the Netherlands	9,464 98
Total	19,863 46
Excess collected in the United States	933 50
Decrease compared with last fiscal year	2,266 02

J. M. McGREW,
Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 22, 1875

No. 23.—*Amount of letter-postage on Italian mails received in and sent from the United States during the fiscal year ended June 30, 1875.*

RECEIVED.

Lines.	Unpaid distributed.	Unpaid.	Paid.	Paid distributed.	Total.
Cunard line	$1,861 36	$1,056 45	.....	$5,530 48	$8,448 29
Dale, or Inman line	1,636 66	1,029 95	.....	4,575 39	7,242 00
North German Lloyd of Bremen	2,749 55	1,752 40	.....	7,387 63	11,889 58
Total	6,247 57	3,838 80	.....	17,493 50	27,579 87
Amount received	.....	10,086 37	$17,493 50	.....	.....

SENT.

Lines.	Paid.	Paid distributed.	Paid stamps.	Unpaid.	Total.
Liverpool and Great Western Steam Company	.....	$1,575 20	.....	$155 97	$1,731 17
North German Lloyd of Bremen	.....	5,844 90	.....	496 51	6,341 41
Hamburg-American Packet Company	.....	3,022 30	.....	333 69	3,355 99
Cunard line	.....	4,840 10	.....	397 15	5,237 25
Eagle line	.....	1,983 70	.....	200 89	2,184 59
White Star line	.....	739 10	.....	59 65	798 75
Dale, or Inman line	.....	47 30	.....	2 09	49 39
Dominion line	.....	146 30	.....	11 77	158 07
Total	.....	18,198 90	.....	1,657 72	19,856 62
Amount sent	$18,198 90	.....	.....	1,657 72	.....

Amount collected in the United States	$28,285 27
Amount collected in Italy	19,151 22
Total	47,436 49
Excess collected in the United States	9,134 05
Increase compared with last fiscal year	2,488 94

J. M. McGREW,
Auditor.

OFFICE OF THE AUDITOR OF THE TREASURY
FOR THE POST-OFFICE DEPARTMENT, *October* 22, 1875.

No. 23½.—*Amount of letter-postage collected on Switzerland mails received in and sent from the United States during the fiscal year ended June 30, 1875.*

RECEIVED.

Lines.	Unpaid.	Unpaid distributed.	Paid.	Paid distributed.	Total.
Cunard line, via England	$218 90	$1,328 80	$5,923 85	.....	$7,471 55
Dale, or Inman line, via England	109 50	1,210 20	4,825 27	.....	6,144 97
North German Lloyd of Bremen, via England	82 55	695 75	3,305 39	.....	4,083 69
Eagle line, via Hamburg	.....	13	8 08	.....	8 21
North German Lloyd of Bremen, direct service, via Bremen	3 98	42 26	857 28	.....	903 52
Hamburg-American Packet Company, direct service, via Humburg	2 34	38 25	929 12	.....	969 71
Total	417 27	3,315 39	15,848 99	.....	19,581 65
Amount received	3,732 66	.....	15,848 99	.....	.....

SENT.

Lines.	Paid.	Paid distributed.	Paid stamps.	Unpaid.	Total.
Liverpool and Great Western Steam Company, via England	.....	$1,102 40	.....	$275 79	$1,378 19
Dale, or Inman line, via England	.....	20 10	.....	2 30	22 40
North German Lloyd of Bremen, via England	.....	4,158 10	.....	831 29	4,989 39
Cunard line, via England	.....	3,269 10	.....	651 33	3,920 43
Eagle line, via England	.....	222 24	.....	16 24	238 48
North German Lloyd of Bremen, via Bremen	.....	907 36	.....	73 30	980 66
Hamburg-American Packet Company, via Hamburg	.....	771 68	.....	67 51	839 19
Hamburg-American Packet Company, via England	.....	2,387 00	.....	526 58	2,912 58
White Star line, via England	$13 50	1,920 27	.....	319 90	2,253 67
Dominion line	.....	102 30	.....	24 80	127 10
Total	13 50	14,860 55	.....	2,789 04	17,663 09
Amount sent	14,874 05	.....	.....	2,789 04	.....

Amount collected in Switzerland	$18,638 03
Amount collected in the United States	18,606 71
Total	37,244 74
Excess collected in Switzerland	31 32
Decrease compared with last fiscal year	1,619 01

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No. 24.—*Amount of letter-postage collected on Danish mails received in and sent from the United States during the fiscal year ended June 30, 1875.*

RECEIVED.

Lines.	Unpaid.	Unpaid distributed.	Paid.	Paid distributed.	Total.
Hamburg-American Packet Company	$203 64	$1,755 53	.....	$3,730 09	$5,689 26
North German Lloyd of Bremen	577 52	952 31	.....	2,547 33	4,077 16
Eagle line	2 01	17 84	.....	24 29	44 14
Total	783 17	2,725 68	.....	6,301 71	9,810 56
Amount received	3,508 85	.....	$6,301 71	.....	.....

SENT.

Lines.	Paid.	Paid distributed.	Paid stamps.	Unpaid.	Total.
Hamburg-American Packet Company	.....	$3,764 14	.....	$523 26	$4,287 40
North German Lloyd of Bremen	.....	3,406 52	.....	516 07	3,922 59
Eagle line	.....	666 19	.....	127 47	793 66
Total	.....	7,836 85	.....	1,166 80	9,003 65
Amount sent	$7,836 85	.....	.....	1,166 80	.....

Amount collected in the United States	$11,345 70
Amount collected in Denmark	7,468 51
Total	18,814 21
Excess collected in the United States	3,877 19
Decrease compared with last fiscal year	1,729 17

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No. 25.—*Amount of letter-postage collected on Norwegian mails received in and sent from the United States during the fiscal year ended June 30, 1875.*

RECEIVED.

Lines.	Unpaid.	Unpaid distributed.	Paid.	Paid distributed.	Total.
Hamburg-American Packet Company, via Hamburg	$413 62	$3,074 91	.....	$4,341 00	$7,829 53
North German Lloyd, of Bremen, via Bremen	100 70	793 93	.....	1,223 70	2,118 33
North German Lloyd, of Bremen, via England	195 57	1,385 67	.....	1,917 60	3,498 84
Eagle line, via Hamburg	57 71	557 34	.....	646 60	1,261 65
Cunard line, via England	12 38	82 10	.....	123 70	218 18
Dale, or Inman line, via England	4 65	63 75	.....	77 00	145 40
Funch, Edye & Co.'s line, (direct)	36	1 08	.....	26 40	27 84
Total	784 99	5,958 78	.....	8,356 00	15,099 77
Amount received	6,743 77	.....	$8,356 00	.....	.....

SENT.

Lines.	Paid.	Paid distributed.	Paid stamps.	Unpaid.	Total.
Hamburg-American Packet Company, via Hamburg	.....	$6,835 10	.....	$1,484 40	$8,319 50
Eagle line, via Hamburg	.....	791 70	.....	262 05	1,053 75
North German Lloyd, of Bremen, via Bremen	.....	2,415 80	.....	533 40	2,949 20
North German Lloyd, of Bremen, via England	.....	3,394 95	.....	819 80	4,214 75
Total	.....	13,437 55	.....	3,099 65	16,537 20
Amount sent	$13,437 55	.....	$3,099 65	.....	.....

Amount collected in the United States	$20,181 32
Amount collected in Norway	11,455 65
Total	31,636 97
Excess collected in the United States	8,725 67
Decrease compared with last fiscal year	2,977 78

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No. 26.—*Amount of letter-postage collected on Swedish mails received in and sent from the United States during the fiscal year ended June 30, 1875.*

RECEIVED.

Lines.	Unpaid.	Unpaid distributed.	Paid.	Paid distributed.	Total.
Hamburg-American Packet Company, via Hamburg	$1,329 47	$10,329 54	.....	$2,421 27	$14,080 28
North German Lloyd, of Bremen, via Bremen	820 20	5,591 77	.....	1,202 86	7,614 83
North German Lloyd, of Bremen, via England	298 86	3,078 24	.....	880 89	4,257 99
Eagle line, via Hamburg	145 66	1,141 91	.....	276 10	1,563 67
Cunard line, via England	38 39	325 55	.....	294 37	658 31
Dale, or Inman line, via England	4 48	25 39	.....	15 12	44 99
Total	2,637 06	20,492 40	.....	5,090 61	28,220 07
Amount received	23,129 46	.....	$5,090 61	.....	.....

SENT.

Lines.	Paid.	Paid distributed.	Paid stamps.	Unpaid.	Total.
Hamburg-American Packet Company, via Hamburg	.....	$8,650 05	.....	$2,424 12	$11,074 17
North German Lloyd, of Bremen, via Bremen	.....	2,824 65	.....	753 26	3,577 91
North German Lloyd, of Bremen, via England	.....	4,381 00	.....	1,448 72	5,829 72
Eagle line, via Hamburg	.....	1,404 27	.....	502 74	1,907 01
Total	.....	17,259 97	.....	5,128 84	22,388 81
Amount sent	$17,259 97	.....	.....	5,128 84	.....

Amount collected in the United States	$40,389 43
Amount collected in Sweden	10,219 45
Total	50,608 88
Excess collected in the United States	30,169 98
Decrease compared with last fiscal year	2,532 25

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No. 27.—*Amount of letter-postage collected on European mails received in and sent from the United States during the fiscal year ended June 30, 1875.*

RECEIVED.

Countries.	Unpaid.	Unpaid distributed.	Paid.	Paid distributed.	Total.
The United Kingdom of Great Britain and Ireland	$14,758 68	$32,023 04	.....	$277,481 66	$324,263 38
Germany	9,987 87	32,023 28	.....	133,740 37	175,751 52
France	4,452 82	6,614 42	.....	54,149 53	65,216 77
Belgium	954 66	1,490 15	.....	6,615 09	9,059 90
Netherlands	135 56	2,133 58	.....	7,794 14	10,063 28
Italy	3,838 80	6,247 57	.....	17,493 50	27,579 87
Switzerland	417 27	3,315 39	.....	15,848 99	19,581 65
Denmark	783 17	2,725 68	.....	6,301 71	9,810 56
Norway	784 99	5,958 78	.....	8,356 00	15,099 77
Sweden	2,637 06	20,492 40	.....	5,090 61	28,220 07
Total	38,750 88	113,024 29	.....	532,871 60	684,646 77
Amount received	151,775 17	.....	$532,871 60	.....	.....

SENT.

Countries.	Paid.	Paid distributed.	Paid stamps.	Unpaid.	Total.
The United Kingdom of Great Britain and Ireland	$16,858 82	$307,493 65	$52 16	$23,521 27	$347,925 90
Germany	7,060 79	169,281 18	.....	19,146 25	195,488 22
France	2,682 92	43,623 37	.....	7,536 18	53,842 47
Belgium	402 56	4,449 67	.....	1,324 55	6,176 78
Netherlands	.....	8,129 34	.....	1,670 84	9,800 18
Italy	.....	18,198 90	.....	1,657 72	19,856 62
Switzerland	13 50	14,860 55	.....	2,789 04	17,663 09
Denmark	.....	7,836 85	.....	1,166 80	9,003 65
Norway	.....	13,437 55	.....	3,099 65	16,537 20
Sweden	.....	17,259 97	.....	5,128 84	22,388 81
Total	27,018 59	604,571 03	52 16	67,041 14	698,682 92
Amount sent	631,641 78	.....	.....	67,041 14	.....

Amount collected in the United States	$783,416 95
Amount collected in European countries	599,912 74
Total	1,383,329 69
Excess collected in the United States	183,504 21
Decrease compared with last fiscal year	55,470 96

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No. 28.—*Number and weight of letters, and weight of newspapers, &c., exchanged between the United States and the United Kingdom, in British mails, during the fiscal year ended June 30, 1875.*

Lines.	Letters.				Newspapers, &c.	
	Received.		Sent.		Received.	Sent.
	Rates.	*Wt. in ozs.*	*Rates.*	*Wt. in ozs.*	*Lbs. Ozs.*	*Lbs. Ozs.*
Cunard line	2, 578, 029	830, 544	1, 684, 407	549, 826	377, 957. 11¾	77, 938. 13¼
Liverpool and Great Western Steam Company	14	4½	485, 342	163, 305	7	49, 209. 11¼
Hamburg-American Packet Company	.....	.....	716, 572	252, 414½	.....	71, 644. 01
Canadian line	2, 137	721½	204, 983	62, 800	4. 02½	16, 877. 05½
White Star line	31, 269	10, 470	1, 014, 935	337, 249¾	606. 08½	86, 484. 07¼
North German Lloyd, of Bremen	988, 521	312, 572½	278, 901	91, 534½	130, 344. 14½	46, 085. 10½
Dale, or Inman line	1, 504, 140	491, 719	438, 065	145, 655¾	170, 774. 14	50, 435. 06¼
Eagle line	.....	.....	364, 123	120, 195¼	.....	35, 776. 12½
American Steamship Com'y	72	22½	55, 472	18, 392	4½	6, 934. 12½
National line	6	2½	6, 263	1, 961½	.....	292. 09¼
Dominion line	.....	.....	47, 062	15, 353¾	.....	4, 908. 07
Anchor line	.....	.....	27, 812	9, 180¼	.....	4, 138. 05¼
Total	5, 104, 188	1, 646, 056½	5, 323, 937	1, 767, 868½	679, 688. 14¾	450, 726. 06¼
Decrease compared with last fiscal year	661, 544	176, 612	979, 897	334, 728¼	28, 976. 14	48, 686. 14

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No. 29.—*Number and weight of letters, and weight of newspapers, &c., exchanged between the United States and Germany, in closed mails, through England and France, and by direct steamer, during the fiscal year ended June 30, 1875.*

Lines.	Letters.				Newspapers, &c.	
	Received.		Sent.		Received.	Sent.
	Rates.	*Grams.*	*Rates.*	*Grams.*	*Grams.*	*Grams.*
Cunard line, via England	229, 276	2, 274, 144	234, 304	2, 302, 763	2, 691, 086	2, 206, 186
Dale, or Inman line, via England	256, 966	2, 592, 797	1, 746	16, 578	2, 132, 850	19, 584
Liverpool and Great Western Steam Company, via England	.....	.....	83, 068	846, 092	.....	657, 212
North German Lloyd, of Bremen, via England	256, 556	2, 539, 558	311, 093	3, 050, 373	2, 911, 810	4, 412, 052
Hamburg-American Packet Company, via England	69, 077	683, 816	187, 539	1, 844, 715	1, 144, 145	1, 258, 817
Eagle line, via England	.....	.....	101, 474	999, 606	.....	786, 651
North German Lloyd, of Bremen, direct	664, 146	6, 605, 087	857, 050	8, 373, 648	11, 005, 032	32, 279, 017
Hamburg-American Packet Company, direct	838, 901	8, 193, 664	775, 017	7, 480. 543	12, 851, 182	26, 937, 745
Eagle line, direct to Hamburg	78, 198	779, 841	185, 843	1, 825, 195	1, 037, 081	5, 046, 414
Baltic Lloyd, direct	12	115	10	89	73	.....
White Star line, via England	.....	.....	33, 046	325, 190	.....	442, 068
Dominion line, via England	.....	.....	7, 120	70, 056	.....	65, 635
French Steamship Company	3, 047	29, 840	.....	.....	40, 165	.....
Total	2, 396, 179	23, 698, 862	2, 777, 310	27, 134, 848	33, 813, 424	74, 111, 371
Compared with last fiscal year. Decrease	80, 038	373, 953	272, 121	2, 001, 331	.....	.....
Compared with last fiscal year. Increase	.....	.....	.....	.....	6, 249, 399	872, 807

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No. 30.—*Number and weight of letters, and weight of newspapers, &c., exchanged between the United States and France during the fiscal year ended June* 30, 1875.

Lines.	Letters.				Newspapers, &c.	
	Received.		Sent.		Received.	Sent.
	Rates.	*Grams.*	*Rates.*	*Grams.*	*Grams.*	*Grams.*
Dale, or Inman line	181, 913	1, 381, 616	5, 630	49, 847	4, 080, 261	189, 165
Cunard line	99, 523	744, 877	157, 301	1, 371, 916	1, 756, 071	4, 662, 883
Hamburg-American Packet Company	79, 199	624, 435	106, 504	939, 777	1, 818, 446	3, 535, 276
North German Lloyd, of Bremen	179, 589	1, 284, 137	88, 364	774, 595	4, 686, 850	2, 358, 262
French Steam Company	87, 820	666, 209	97, 703	852, 758	909, 460	2, 800, 188
Liverpool and Great Western Steam Company	.....	.....	44, 937	374, 826	.....	1, 286, 243
National line	.....	.....	266	2, 436	.....	12, 218
Eagle line	.....	.....	63, 831	538, 160	.....	1, 679, 617
White Star line	.....	.....	11, 693	103, 729	.....	305, 508
Dominion line	.....	.....	4, 857	40, 730	.....	175, 013
Total	628, 104	4, 701, 274	581, 086	5, 048, 774	13, 251, 088	17, 004, 373
Increase compared with last fiscal year	531, 517	3, 951, 725	517, 352	4, 367, 524	12, 072, 660	5, 048, 913

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No. 31.—*Number and weight of letters, and weight of newspapers, &c., exchanged between the United States and Belgium during the fiscal year ended June* 30, 1875.

Lines.	Letters.				Newspapers, &c.	
	Received.		Sent.		Received.	Sent.
	Rates.	*Grams.*	*Rates.*	*Grams.*	*Grams.*	*Grams.*
Cunard line	37, 024	318, 601	18, 860	184, 009	1, 025, 881	570, 630
Dale, or Inman line	27, 695	234, 219	134	1, 470	671, 084	4, 376
North German Lloyd, of Bremen	26, 123	219, 666	24, 345	233, 770	921, 094	874, 014
Red Star line	4, 966	38, 841	1, 503	13, 044	54, 953	120, 551
Liverpool and Great Western Steam Company	.....	.....	5, 374	48, 714	.....	168, 357
Hamburg-American Packet Company	.....	.....	14, 938	145, 499	.....	367, 921
Eagle line	.....	.....	6, 388	58, 051	.....	193, 927
White Star line	.....	.....	2, 484	23, 064	.....	89, 645
Dominion line	.....	.....	476	4, 224	.....	16, 928
National line	.....	.....	32	300	.....	240
Total	95, 808	811, 327	74, 534	712, 145	2, 673, 012	2, 406, 589
Compared with last fiscal year: Increase	11, 486	92, 440	.....	.....	.....	163, 783
Compared with last fiscal year: Decrease	.....	.....	2, 663	27, 096	7, 509	.....

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No. 32.—*Number and weight of letters, and weight of newspapers, &c., exchanged between the United States and Switzerland, in closed mails, via England and Belgium, and by direct steamer, via Bremen and Hamburg, during the fiscal year ended June 30, 1875.*

Lines.	Letters.				Newspapers, &c.	
	Received.		Sent.		Received.	Sent.
	Rates.	*Grams.*	*Rates.*	*Grams.*	*Grams.*	*Grams.*
Cunard line, via England	69, 584	587, 263	39, 248	357, 902	922, 117	902, 568
Dale, or Inman line, via England	57, 042	458, 158	224	2, 125	458, 941	6, 795
North German Lloyd of Bremen, via England	38, 286	314, 702	49, 980	456, 749	665, 117	1, 536, 677
Eagle line, via Hamburg	102	850	2, 981	27, 304	8, 601	274, 765
North German Lloyd of Bremen, direct service to Bremen	11, 074	93, 038	12, 262	115, 007	1, 046, 962	1, 346, 086
Hamburg-American Packet Company, direct service to Hamburg	11, 927	99, 244	10, 490	107, 095	1, 208, 906	1, 121, 844
Liverpool and Great Western Steam Company, via England	.....	.....	13, 829	122, 158	.....	289, 105
Hamburg-American Packet Company, via England	.....	.....	29, 009	269, 022	.....	685, 691
White Star line, via England	.....	.....	24, 692	213, 974	.....	729, 711
Dominion line	.....	.....	1, 271	11, 150	.....	27, 180
Total	188, 015	1, 553, 255	183, 986	1, 282, 486	4, 310, 644	6, 920, 422
Compared with last fiscal year: Increase	.....	.....	.....	.....	912, 164	682, 962
Compared with last fiscal year: Decrease	4, 434	25, 938	7, 954	447, 849	.....	.....

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No. 33.—*Number and weight of letters, and weight of newspapers, &c., exchanged between the United States and The Netherlands, during the fiscal year ended June 30, 1875.*

Lines.	Letters.				Newspapers, &c.	
	Received.		Sent.		Received.	Sent.
	Rates.	*Grams.*	*Rates.*	*Grams.*	*Grams.*	*Grams.*
Cunard line	29, 732	288, 126	22, 431	216, 677	546, 323	360, 900
Dale, or Inman line	35, 829	328, 148	171	1, 685	674, 360	4, 439
North German Lloyd of Bremen	24, 872	228, 335	31, 813	298, 356	568, 971	914, 061
Netherlands Steam Navigation Company	3, 970	38, 237	4, 073	35, 287	38, 101	53, 944
Liverpool and Great Western Steam Company	.....	.....	7, 376	67, 740	.....	102, 468
Hamburg-American Packet Company	.....	.....	19, 429	184, 832	.....	309, 973
Eagle line	.....	.....	10, 620	97, 280	.....	196, 564
White Star line	.....	.....	3, 571	32, 955	.....	75, 598
Dominion line	.....	.....	581	5, 290	.....	11, 778
Total	94, 403	882, 846	100, 065	940, 032	1, 827, 755	1, 959, 735
Compared with last fiscal year: Increase	.....	.....	.....	.....	112, 958	4, 025
Compared with last fiscal year: Decrease	2, 692	19, 230	14, 708	152, 215	.....	.....

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No. 34.—*Number and weight of letters, and weight of newspapers, &c., exchanged between the United States and Denmark during the fiscal year ended June* 30, 1875.

Lines.	Letters.				Newspapers, &c.	
	Received.		Sent.		Received.	Sent.
	Rates.	*Grams.*	*Rates.*	*Grams.*	*Grams.*	*Grams.*
Hamburg-American Packet Company	70, 969	651, 051	59, 762	550, 262	1, 031, 980	727, 443
North German Lloyd of Bremen	49, 989	430, 585	54, 352	498, 571	694, 810	553, 297
Eagle Line	508	4, 650	10, 830	95, 889	26, 700	106, 289
Total	121, 466	1, 086, 286	124, 944	1, 144, 722	1, 753, 490	1, 387, 029
Compared with last fiscal year. Decrease	13, 519	71, 233	13, 781	132, 355	.....	.....
Compared with last fiscal year. Increase	.....	.....	.....	.....	303, 856	356, 973

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No. 35.—*Number and weight of letters, and weight of newspapers, &c., exchanged between the United States and Italy during the fiscal year ended June* 30, 1875.

Lines.	Letters.				Newspapers, &c.	
	Received.		Sent.		Received.	Sent.
	Rates.	*Grams.*	*Rates.*	*Grams.*	*Grams.*	*Grams.*
Cunard line	69, 969	524, 990	52, 225	436, 010	742, 117	1, 275, 531
Dale, or Inman line	59, 630	444, 789	492	4, 230	803, 390	10, 873
North German Lloyd of Bremen	98, 450	731, 630	63, 075	533, 327	1, 062, 873	1, 840, 964
Liverpool and Great Western Steam Company	.....	.....	17, 231	142, 912	.....	376, 394
Hamburg-American Packet Company	.....	.....	33, 408	288, 498	.....	1, 033, 510
Eagle line	.....	.....	21, 725	178, 765	.....	492, 092
White Star line	.....	.....	7, 938	67, 555	.....	222, 823
Dominion line	.....	.....	1, 570	12, 980	.....	57, 984
Total	228, 049	1, 701, 409	197, 664	1, 664, 277	2, 608, 380	5, 310, 071
Increase compared with last fiscal year	21, 827	188, 101	544	22, 480	338, 768	481, 318

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No. 36.—*Number and weight of letters, and weight of newspapers, &c., exchanged between the United States and Sweden during the fiscal year ended June 30, 1875.*

Lines.	Letters.				Newspapers, &c.	
	Received.		Sent.		Received.	Sent.
	Rates.	*Grams.*	*Rates.*	*Grams.*	*Grams.*	*Grams.*
Hamburg-American Packet Company, via Hamburg	110, 226	768, 875	112, 952	1, 047, 002	689, 602	1 06c, 733
North German Lloyd of Bremen, via Bremen	59, 019	427, 700	36, 859	339, 238	334, 109	442, 093
North German Lloyd of Bremen, via England	33, 779	291, 113	58, 864	533, 830	516, 551	850, 336
Eagle line, via Hamburg	12, 167	90, 620	19, 194	172, 064	58, 350	105, 522
Dale, or Inman line, via England	382	3, 210	.....	.....	2, 690	.....
Cunard line, via England	5, 505	42, 122	.....	.....	56, 243	.....
Total	221, 078	1, 623, 640	227, 869	2, 092, 134	1, 657, 455	2, 466, 684
Compared with last fiscal year. Increase	6, 474	39, 791	2	.....	683, 696	695, 153
Compared with last fiscal year. Decrease	.....	.....	24, 463	284, 905	.....	.....

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No. 37.—*Number and weight of letters, and weight of newspapers, &c., exchanged between the United States and Norway during the fiscal year ended June 30, 1875.*

Lines.	Letters.				Newspapers, &c.	
	Received.		Sent.		Received.	Sent.
	Rates.	*Grams.*	*Rates.*	*Grams.*	*Grams.*	*Grams.*
Hamburg-American Packet Company, via Hamburg	66, 717	524, 990	78, 319	743, 278	290, 060	1, 131, 514
North German Lloyd of Bremen, via Bremen	18, 221	143, 170	27, 714	259, 766	70, 105	165, 511
North German Lloyd of Bremen, via England	29, 773	244, 970	39, 343	366, 832	156, 100	353, 263
Eagle line, via Hamburg	10, 567	63, 570	9, 664	86, 610	61, 385	61, 999
Cunard line, via England	1, 872	14, 950	.....	.....	5, 550	.....
Dale, or Inman line, via England	1, 216	9, 500	.....	.....	2, 500	.....
Funch, Edye & Co.'s line, (direct service)	446	4, 170	.....	.....	6, 020	.....
Total	128, 812	1, 005, 320	155, 040	1, 456, 486	591, 720	1, 712, 287
Compared with last fiscal year. Decrease	13, 181	117, 231	12, 530	122, 780	.....	.....
Compared with last fiscal year. Increase	.....	.....	.....	.....	108, 805	365, 287

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No. 38.—*Statement of letters and newspapers, with the several postages, received in and sent from the United States to Ecuador during the fiscal year ended June* 30, 1875.

Pacific Mail Steamship Company.	Letters.	Newspapers, &c.	Postage on letters.
Received	2,761	372	$552 20
Sent	4,074	8,207	814 80
Total	6,835	8,579	1,367 00
Add newspaper-postages, at two cents each			171 58
Total postages			1,538 58
Increase compared with last fiscal year	621	1,260	149 40

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No. 39.—*Statement of letters and newspapers, with the several postages, received in and sent from the United States to Venezuela during the fiscal year ended June* 30, 1875.

Pim, Forwood & Co's. Line.	Letters.	Newspapers, &c.	Postage on letters.
Received	2,938	423	$88 14
Sent	3,004	2,539	300 40
Total	5,942	2,962	388 54
Add newspaper-postages, at two cents each			59 24
Total postages			447 78
Compared with last fiscal year { Increase	515	503	
Compared with last fiscal year { Decrease			39 03

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No. 40.—*Statement of letters and newspapers, with the several postages, received in and sent from the United States to New Granada during the fiscal year ended June* 30, 1875.

Pim, Forwood & Co.'s Line.	Letters.	Newspapers, &c.	Postage on letters.
Received	10,386	2,434	$1,036 74
Sent	9,487	11,853	958 70
Total	19,873	14,287	1,995 44
Add newspaper-postages, at two cents each			285 74
Total postages			2,281 18
Increase compared with last fiscal year	4,753	8,303	650 82

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No. 41.—*Statement of letters and newspapers, with the several postages, received in and sent from the United States to Panama and Colon during the fiscal year ended June* 30, 1875.

Pacific Mail Steamship Company.	Letters.	Newspapers, &c.	Postage on letters.
Received	113, 477	65, 914	$12, 421 95
Sent	106, 863	184, 457	15, 931 98
Total	220, 340	250, 371	28, 353 93
Add newspaper-postages, at two cents each	.....	.....	5, 007 42
Total postages	.....	.....	33, 361 35
Increase compared with last fiscal year	12, 984	24, 349	1, 728 86

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No. 42.—*Statement of letters and newspapers, with the several postages, received in and sent from the United States to Mexico during the fiscal year ended June* 30, 1875.

United States and Mexican Steamship Company.	Letters.	Newspapers, &c.	Postage on letters.
Received	28, 509	17, 620	$1, 022 32
Sent	39, 927	45, 536	4, 019 40
Total	68, 436	63, 156	5, 041 72
Add newspaper-postages, at two cents each	.....	.....	1, 263 12
Total postages	.....	.....	6, 304 84
Increase compared with last fiscal year	16, 514	3, 554	1, 249 83

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No. 43.—*Statement of letters and newspapers, with the several postages, received in and sent from the United States to Brazil during the fiscal year ended June* 30, 1875.

	Letters.	Newspapers, &c.	Postage on letters.
Received	40, 870	27, 313	$5, 818 94
Sent	56, 112	68, 554	8, 638 90
Total	96, 982	95, 867	14, 457 84
Add newspaper-postages, at two cents each	.....	.....	1, 917 34
Total postages	.....	.....	16, 375 18
Increase compared with last fiscal year	551	13, 443	57 84

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No. 44.—*Statement of letters and newspapers, with the several postages, received in and sent from the United States to the West India Islands during the fiscal year ended June* 30, 1875.

West India mail-steamers.	Letters.	Newspapers, &c.	Postage on letters.
Received	544, 577	117, 942	$50, 808 97
Sent	379, 215	210, 657	30, 387 66
Total	923, 792	328, 599	81, 196 63
Add newspaper-postages, at two cents each			6, 371 98
Total postages			87, 568 61
Compared with last fiscal year { Increase	47, 351	22	
Compared with last fiscal year { Decrease			8, 046 96

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No. 45.—*Statement of letters and newspapers, with the several postages, received in and sent from the United States to Japan and China during the fiscal year ended June* 30, 1875.

Pacific Mail Steamship Company.	Letters.	Newspapers, &c.	Postage on letters.
Received	171, 196	105, 498	$9, 878 35
Sent	96, 723	162, 727	10, 453 20
Total	267, 919	268, 225	20, 331 55
Add newspaper-postages, at two cents each			5, 364 50
Total postages			25, 696 05
Compared with last fiscal year { Increase	43, 565		
Compared with last fiscal year { Decrease		45, 538	5, 509 31

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No. 46.—*Statement of letters and newspapers, with the several postages, received in and sent from the United States to Honolulu, Auckland, Melbourne, Sydney, &c., during the fiscal year ended June* 30, 1875.

American and Australian Mail Steamship Company.	Letters.	Newspapers, &c.	Postage on letters.
Received	82, 320	65, 188	$1, 710 90
Sent	77, 053	161, 179	7, 740 30
Total	159, 373	226, 367	9, 451 20
Add newspaper-postages, at two cents each			4, 527 34
Total postages			13, 978 54
Increase compared with last fiscal year	87, 153	125, 845	7, 882 74

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Amounts reported as due the steamers of the Hamburg-American Packet Company for services rendered during the fiscal year ended June 30, 1875.

Quarter ended September 30, 1874	$8,772 20
Quarter ended December 31, 1874	12,257 35
Quarter ended March 31, 1875	11,048 97
Quarter ended June 30, 1875	12,270 64
Total amount paid	44,349 16

Amounts reported as due the steamers of the Cunard line for services rendered during the fiscal year ended June 30, 1875.

Quarter ended September 30, 1874	$11,874 48
Quarter ended December 31, 1874	10,493 75
Quarter ended March 31, 1875	12,715 90
Quarter ended June 30, 1875	14,116 85
Total amount paid	49,200 98

Amounts reported as due the steamers of the Liverpool and Great Western Steam Company for services rendered during the fiscal year ended June 30, 1875.

Quarter ended September 30, 1874	$6,008 28
Quarter ended December 31, 1874	2,685 50
Quarter ended March 31, 1875	4,069 94
Quarter ended June 30, 1875	2,605 12
Total amount paid	15,368 84

Amounts reported as due the steamers of the White Star line for services rendered during the fiscal year ended June 30, 1875.

Quarter ended September 30, 1874	$5,938 00
Quarter ended December 31, 1874	7,760 48
Quarter ended March 31, 1875	8,676 45
Quarter ended June 30, 1875	4,408 96
Total amount paid	26,783 89

Amounts reported as due the steamers of the Eagle line for services rendered during the fiscal year ended June 30, 1875.

Quarter ended September 30, 1874	$3,412 81
Quarter ended December 31, 1874	6,406 67
Quarter ended March 31, 1875	4,154 71
Quarter ended June 30, 1875	3,057 37
Total amount paid	17,031 56

Amounts reported as due the steamers of the Red Star line for services rendered during the fiscal year ended June 30, 1875.

Quarter ended September 30, 1874	$7 25
Quarter ended December 31, 1874	8 10
Quarter ended March 31, 1875	12 93
Quarter ended June 30, 1875	14 23
Total amount paid	42 51

Amounts reported as due the steamers of the American Steamship Company for services rendered during the fiscal year ended June 30, 1875.

Quarter ended September 30, 1874	$645 91
Quarter ended December 31, 1874	521 27
Quarter ended March 31, 1875	629 02
Quarter ended June 30, 1875	519 54
Total amount paid	2,315 74

Amounts reported as due the steamers of the National line for services rendered during the fiscal year ended June 30, 1875.

Quarter ended December 31, 1874	$73 96
Quarter ended March 31, 1875	80 92
Total amount paid	154 88

Amounts reported as due the steamers of the Dominion line for services rendered during the fiscal year ended June 30, 1875.

Quarter ended March 31, 1875	$1,386 31
Quarter ended June 30, 1875	84 74
Total amount paid	1,471 05

Amounts reported as due the steamers of the Anchor line for services rendered during the fiscal year ended June 30, 1875.

Quarter ended June 30, 1875	$794 55
Total amount paid	794 55

The sea-postages on the mails conveyed from the United States to France by the steamers of the French Steamship Company, and settled in the accounts between the United States and France, during the fiscal year ended June 30, 1875.

Quarter ended September 30, 1874	$286 93
Quarter ended December 31, 1874	457 82
Quarter ended March 31, 1875	556 19
Quarter ended June 30, 1875	623 74
Total	1,924 68

The sea-postages on the mails conveyed from the United States to Netherlands by the steamers of the Netherlands Steam Navigation Company, and settled in the accounts between the United States and Netherlands, during the fiscal year ended June 30, 1875.

Quarter ended September 30, 1874	$3 73
Quarter ended December 31, 1874	28 36
Quarter ended March 31, 1875	25 16
Quarter ended June 30, 1875	29 61
Total	86 86

Amounts reported as due the steamers of the Pacific Mail Steamship Company for the conveyance of the mails between the United States and Panama during the fiscal year ended June 30, 1875.

Quarter ended September 30, 1874	$12,914 42
Quarter ended December 31, 1874	10,244 69
Quarter ended March 31, 1875	6,519 41
Quarter ended June 30, 1875	7,070 14
Total amount paid	36,748 66

Amounts reported as due the steamers conveying the mails between the United States and the West India Islands, Mexico, Brazil, Bermuda, New Granada, and New Zealand for services rendered during the fiscal year ended June 30, 1875.

Quarter ended September 30, 1874	$17,499 63
Quarter ended December 31, 1874	16,027 29
Quarter ended March 31, 1875	18,260 12
Quarter ended June 30, 1875	17,722 58
Total amount paid	69,509 62

Amounts reported as due the steamers conveying the mails between the United States and Nova Scotia for services rendered during the fiscal year ended June 30, 1875.

Quarter ended September 30, 1874	$690 23
Quarter ended December 31, 1874	628 67
Quarter ended March 31, 1875	354 96
Quarter ended June 30, 1875	312 02
Total amount paid	1,985 88

Amount reported as due the steamer City of Sandusky for services rendered in carrying the mails from Cleveland, Ohio, to London, Ontario.

From April 1, 1874, to October 28, 1874	$194 25
Total amount paid	194 25

The following reports for the transportation of closed mails, for the periods named, have been made during the fiscal year ended June 30, 1875:

To the steamers of the Liverpool and Great Western Steam Company:

For quarter ended December 31, 1873	$610 80
For quarter ended March 31, 1874	668 03
For quarter ended June 30, 1874	2,801 08
For quarter ended September 30, 1874	1,385 12
Total	5,465 03

To the steamers of the Cunard line:

For quarter ended December 31, 1873	$230 86
For quarter ended March 31, 1874	1,985 51
For quarter ended June 30, 1874	410 63
For quarter ended September 30, 1874	489 07
Total	3,116 07

To the steamers of the White Star line:

For quarter ended December 31, 1873	$108 09
For quarter ended March 31, 1874	112 78
For quarter ended June 30, 1874	82 26
For quarter ended September 30, 1874	42 11
Total	245 24

To the steamers of the Hamburg-American Packet Company:

For quarter ended December 31, 1873	$255 87
For quarter ended March 31, 1874	179 49
For quarter ended June 30, 1874	173 51
For quarter ended September 30, 1874	1,528 83
Total	2,137 70

To the steamers of the North German Lloyd of Bremen:

For quarter ended March 31, 1874	$16 06
For quarter ended June 30, 1874	1,161 15
For quarter ended September 30, 1874	1 44
Total	1,178 65

To the steamers of the Eagle Hamburg line:

For quarter ended June 30, 1874	$14 39
For quarter ended September 30, 1874	1,356 70
Total	1,371 09

To the steamers of the Dale, or Inman line:

For quarter ended June 30, 1874	$17 95
For quarter ended September 30, 1874	29 42
Total	47 37

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No. 51.—*Balances due the United States on the adjustment of the postal accounts between the United States and Switzerland for the quarters indicated; settlements made during the fiscal year ended June* 30, 1875.

Quarter ended September 30, 1874	$3,334 00
Quarter ended December 31, 1874	2,334 03
Quarter ended March 31, 1875	2,176 52
Total	7,844 55

Balances due the United States on the adjustment of the postal accounts between the United States and The Netherlands for the quarters indicated, settlements made during the fiscal year ended June 30, 1875.

Quarter ended September 30, 1874	$1,212 39
Quarter ended December 31, 1874	1,179 92
Quarter ended March 31, 1875	1,206 56
Total	3,598 87

Balances due the United States on the adjustment of the postal accounts between the United States and Italy for the quarters indicated, settlements made during the fiscal year ended June 30, 1875.

Quarter ended June 30, 1874	$1,333 48
Quarter ended September 30, 1874	925 42
Quarter ended December 31, 1874	1,511 18
Quarter ended March 31, 1875	1,802 39
Total	5,572 47

Balances due the United States on the adjustment of the extranational postal accounts between the United States and France for the quarters indicated, settlements made during the fiscal year ended June 30, 1875.

Quarter ended September 30, 1874	$2,845 48
Quarter ended December 30, 1874	4,598 08
Quarter ended March 30, 1875	4,622 58
Total	12,066 14

Balances due from the United States to the United Kingdom of Great Britain and Ireland on the adjustment of the postal accounts between the United States and the United Kingdom for the quarters indicated, settlements made during the fiscal year ended June 30, 1875.

Quarter ended December 31, 1873	$24,832 43
Quarter ended March 31, 1874	14,390 38
Quarter ended June 30, 1874	11,876 11
Quarter ended September 30, 1874	9,875 41
Quarter ended December 31, 1874	6,666 93
Total	67,641 26

Balances due from the United States to the Empire of Germany on the adjustment of the postal accounts between the United States and Germany for the quarters indicated, settlements made during the fiscal year ended June 30, 1875.

Quarter ended June 30, 1874	$15,222 40
Quarter ended September 30, 1874	13,611 32
Quarter ended December 31, 1874	14,248 24
Quarter ended March 31, 1875	13,718 18
Total	56,800 14

Balances due from the United States to the kingdom of Denmark on the adjustment of the extra-national postal accounts between the United States and Denmark for the quarters indicated, settlements made during the fiscal year ended June 30, 1875.

Quarter ended June 30, 1874	$570 99
Quarter ended September 30, 1874	310 97
Quarter ended December 31, 1874	503 72
Quarter ended March 31, 1875	574 11
Total	1,959 79

Balances due from the United States to the kingdom of Belgium on the adjustment of the postal accounts between the United States and Belgium for the quarters indicated, settlements made during the fiscal year ended June 30, 1875.

Quarter ended June 30, 1874	$2,159 37
Quarter ended September 30, 1874	2,134 36
Quarter ended December 31, 1874	2,114 66
Quarter ended March 31, 1875	2,249 32
Total	8,657 71

Balances due from the United States to the kingdom of Sweden on the adjustment of the postal accounts between the United States and Sweden for the quarters indicated, settlements made during the fiscal year ended June 30, 1875.

Quarter ended June 30, 1874	$3,850 45
Quarter ended September 30, 1874	4,317 76
Quarter ended December 31, 1874	3,291 67
Quarter ended March 31, 1875	4,506 04
Total	15,965 92

Balances due from the United States to the kingdom of Norway on the adjustment of the postal accounts between the United States and Norway for the quarters indicated, settlements made during the fiscal year ended June 30, 1875.

Quarter ended December 31, 1873	$1,481 67
Quarter ended March 31, 1874	1,931 68
Quarter ended June 30, 1874	1,311 01
Quarter ended September 30, 1874	838 96
Quarter ended December 31, 1874	1,136 32
Total	6 699 64

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